South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

A G E N D A

MEETING, FEBRUARY 6, 2015

A meeting of the South Coast Air Quality Management District Board will be held at 9:00 a.m., in the Auditorium at SCAQMD Headquarters, 21865 Copley Drive, Diamond Bar, California.

Questions About an Agenda Item	▪ The name and telephone number of the appropriate staff person to call for additional information or to resolve concerns is listed for each agenda item. ▪ In preparation for the meeting, you are encouraged to obtain whatever clarifying information may be needed to allow the Board to move expeditiously in its deliberations.
Meeting Procedures	▪ The public meeting of the SCAQMD Governing Board begins at 9:00 a.m. The Governing Board generally will consider items in the order listed on the agenda. However, any item may be considered in any order. ▪ After taking action on any agenda item not requiring a public hearing, the Board may reconsider or amend the item at any time during the meeting.
Questions About Progress of the Meeting	▪ During the meeting, the public may call the Clerk of the Board's Office at (909) 396-2500 for the number of the agenda item the Board is currently discussing.

The agenda and documents in the agenda packet will be made available upon request in appropriate alternative formats to assist persons with a disability. Disability-related accommodations will also be made available to allow participation in the Board meeting. Any accommodations must be requested as soon as practicable. Requests will be accommodated to the extent feasible. Please telephone the Clerk of the Boards Office at (909) 396-2500 from 7:00 a.m. to 5:30 p.m. Tuesday through Friday.

All documents (i) constituting non-exempt public records, (ii) relating to an item on the agenda, and (iii) having been distributed to at least a majority of the Governing Board after the agenda is posted, are available prior to the meeting for public review at the South Coast Air Quality Management District Clerk of the Board's Office, 21865 Copley Drive, Diamond Bar, CA 91765.

The Agenda is subject to revisions. For the latest version of agenda items herein or missing agenda items, check the District's web page (www.aqmd.gov) or contact the Clerk of the Board, (909) 396-2500. Copies of revised agendas will also be available at the Board meeting.

CALL TO ORDER

- Pledge of Allegiance
- Opening Comments: William A. Burke, Ed.D., Chair
  Other Board Members
  Barry R. Wallerstein, D. Env., Executive Officer
- Presentation of Retirement Awards to Phillip Szymanski and Lawrence Watkins **Burke**
- Swearing In of Board Members Michael D. Antonovich and Joseph K. Lyou, PhD. and New Board Member Janice Rutherford **Burke**

Staff/Phone (909) 396-

CONSENT CALENDAR (Items 1 through 12) *

Note: Consent Calendar items held for discussion will be moved to Item No. 13

1. Approve Minutes of January 9, 2015 Board Meeting **McDaniel/2500**

Budget/Fiscal Impact

2. Amend Contract with Norton Engineering for NOx RECLAIM Technical Evaluation **Chang/3186**

   This action is to amend the contract with Norton Engineering to provide supplemental technical evaluation in support of the NOx RECLAIM rule amendment process. The current contract for technical support was signed in September 2014 at a cost not to exceed $75,000. Norton Engineering has satisfactorily completed the tasks outlined in the current contract. The proposed amendment to the work statement would add $12,000 to the contract total, thus requiring Board approval. (Reviewed: Stationary Source Committee, January 23, 2015; Recommended for Approval)

***Please note that, at the January 9, 2015 Board Meeting, a public hearing on Proposed Amended Rule 1420.1 was set for the March 6, 2015 Board Meeting, which will be held in the Council Chambers at Long Beach City Hall, 333 W. Ocean Blvd, Long Beach, CA.*

3. Recognize Funds, Adopt Resolution to Extend Caltrans Grant Agreement, and Execute and Amend Contracts **Miyasato/3249**

On February 7, 2014, the Board recognized U.S. EPA funds for diesel emissions reduction projects under the Diesel Emissions Reduction Act (DERA). This action is to recognize $110,627 in additional Fiscal Year 13 (FY13) DERA funds into the Lower-Emission School Bus Fund (33) and execute contracts totaling $825,000 from the Lower-Emission School Bus Fund (33) to replace diesel school buses with electric buses. This action is also to adopt a resolution to extend a Caltrans grant agreement and amend contracts to reallocate unused funds for replacement of heavy-duty diesel trucks with CNG trucks totaling $350,000 from the Proposition 1B-Goods Movement Program Fund (81). Finally, this action is to amend a contract at no additional cost under the Carl Moyer Program. (Reviewed: Technology Committee, January 23, 2015; Recommended for Approval)

4. Recognize Funds and Execute Contract for Heavy-Duty Advanced Technology Assessment **Miyasato/3249**

NOx emissions from on-road heavy-duty diesel trucks are the largest contributor to ozone and fine particulate air quality in the South Coast Air Basin. As such, there is a need to better understand and plan for the deployment of zero and near-zero emission advanced technologies in this sector. The Southern California Gas Company (SoCalGas) has expressed interest in cofunding a study that would help achieve this objective. This action is to recognize $250,000 from SoCalGas into the Clean Fuels Fund (31). This action is to also execute a contract with U.S. DOE's National Renewable Energy Laboratory to develop a detailed technology and economics-based assessment for the deployment of advanced heavy-duty vehicle technologies suitable in commercial fleet applications in an amount not to exceed $500,000 from the Clean Fuels Fund (31). (Reviewed: Technology Committee, January 23, 2015; Recommended for Approval)

5. Execute Contracts for Advanced Optical Remote Sensing Technologies at Refineries, Other VOC Sources and Marine Vessels **Tisopulos/3123**

Recent advances in optical remote sensing (ORS) technology have made it possible to quantify fugitive emissions from an entire refinery complex and other sources. In September 2014, an RFP was issued to conduct a series of measurements intended to fully characterize and quantify fugitive and stack emissions from large refineries, other important VOC sources and marine vessels and to develop remote sensing technologies with the intent of providing real-time data capability. Several proposals were received from different contractors and evaluated to select the most competitive bids. This action is to execute contracts with multiple contractors employing a variety of different advanced ORS technologies in an amount not to exceed $1,100,805 from the Rule 1118 Mitigation Fund (54). (Reviewed: Technology Committee, January 23, 2015; Recommended for Approval)

6. Approve Contract Awards and Modifications Approved by MSRC **Pettis**

As part of their FYs 2012-14 AB 2766 Discretionary Fund Work Program, the MSRC approved three new contracts as well as correction of an award under the Alternative Fuel Infrastructure Program, and a contract value increase under the Alternative Fuel School Bus Incentives Program. As part of their FYs 2014-16 Work Program, the MSRC approved exercising the contract option with Mineral Studios for continuation of website services for two more years. At this time the MSRC seeks Board approval of the contract awards and modifications. (Reviewed: Mobile Source Air Pollution Reduction Review Committee, January 15, 2015; Recommended for Approval)

Items 7 through 12 - Information Only/Receive and File

7. Legislative and Public Affairs Report **Smith/3242**

This report highlights the December 2014 outreach activities of Legislative and Public Affairs, which include: Environmental Justice Update, Community Events/Public Meetings, Business Assistance, and Outreach to Business and Federal, State, and Local Government. (No Committee Review)

8. Hearing Board Report **Camarena/2500**

This reports the actions taken by the Hearing Board during the period of December 1 through December 31, 2014. (No Committee Review)

9. Civil Filings and Civil Penalties Report **Wiese/3460**

This reports the monthly penalties from December 1 through December 31, 2014, and legal actions filed by the General Counsel's Office from December 1 through December 31, 2014. An Index of District Rules is attached with the penalty report. (Reviewed: Stationary Source Committee, January 23, 2015)

10. Lead Agency Projects and Environmental Documents Received by SCAQMD **Chang/3186**

This report provides, for the Board's consideration, a listing of CEQA documents received by the SCAQMD between December 1, 2014 and December 31, 2014, and those projects for which the SCAQMD is acting as lead agency pursuant to CEQA. (Reviewed: Mobile Source Committee, January 23, 2015)

11. Rule and Control Measure Forecast **Chang/3186**

This report highlights SCAQMD rulemaking activities and public workshops potentially scheduled for the year 2015. (No Committee Review)

12. Status Report on Major Projects for Information Management Scheduled to Start During Last Six Months of FY 2014-15 **Marlia/3148**

Information Management is responsible for data systems management services in support of all SCAQMD operations. This action is to provide the monthly status report on major automation contracts and projects to be initiated by Information Management during the last six months of FY 2014-15. (No Committee Review)

13. Items Deferred from Consent Calendar

BOARD CALENDAR

14. Administrative Committee (Receive & File) **Chair: Burke** **Wallerstein/3131**

15. Legislative Committee **Smith/3242**

Receive and file; and take the following actions as recommended:

Agenda Item	Recommendation
H.R. 5101 (Hahn) National Freight Network Trust Fund Act of 2014	Support with Amendments
Proposed Changes to Carl Moyer Program - "The Five Pillars"	Approve

16. Mobile Source Committee (Receive & File) **Chair: Parker** **Chang/3186**

17. Stationary Source Committee (Receive & File) **Chair: Yates** **Nazemi/2662**

18. Technology Committee (Receive & File) **Chair: J. Benoit** **Miyasato/3249**

19. Mobile Source Air Pollution Reduction Review Committee (Receive & File) **Board Liaison: Antonovich** **Hogo/3184**

20. California Air Resources Board Monthly Report (Receive & File) **Board Rep: Mitchell** **McDaniel/2500**

21. Status Report on Regulation XIII - New Source Review **Nazemi/2662**

This report presents the federal preliminary determination of equivalency for January 2013 through December 2013. As such, it provides information regarding the status of Regulation XIII – New Source Review in meeting federal NSR requirements and shows that SCAQMD's NSR program is in preliminary compliance with applicable federal requirements from January 2013 through December 2013. (Reviewed: Stationary Source Committee, January 23, 2015)

PUBLIC HEARING

22. Supplement to 24-hour PM2.5 State Implementation Plan for South Coast Air Basin **Fine/2239**

The purpose of this Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin is to demonstrate attainment of the 2006 24-hour PM2.5 National Ambient Air Quality Standard by 2015 under Clean Air Act, Title 1, Part D, Subpart 4, along with updates to the transportation conformity budgets, analysis of Reasonably Available Control Measures/Reasonably Available Control Technology, control measure commitments submitted in the 2012 AQMP, and other Subpart 4 requirements. This action is to adopt the resolution: 1) Determining that the project is exempt from the requirements of CEQA; and 2) Approving the Supplement to the 24-hour PM2.5 State Implementation Plan for the South Coast Air Basin for submittal into the SIP. (Reviewed: Mobile Source Committee, January 23, 2015)

OTHER BUSINESS

23. Communities for a Better Environment's Request for Hearing Regarding Certification of Negative Declaration in Connection with Permitting Tank Project at Phillips 66 Carson Refinery **Wiese/3460**

Communities for a Better Environment has submitted documents in which it purports to appeal the Executive Officer's approval and certification of a Negative Declaration that was done as part of the approval of SCAQMD permits for Phillips 66 to construct a new crude oil storage tank and make related changes at its Carson Refinery. This item is for the Board to consider whether to grant Communities for a Better Environment a hearing on its so-called appeal. (No Committee Review)

PUBLIC COMMENT PERIOD – (Public Comment on Non-Agenda Items, Pursuant to Government Code Section 54954.3)

BOARD MEMBER TRAVEL – (*No Written Material*)

Board member travel reports have been filed with the Clerk of the Boards, and copies are available upon request.

CONFLICT OF INTEREST DISCLOSURES – *(No Written Material)*

Under the approval authority of the Executive Officer, the District will enter into a contract (Contract No. C15516) with Cordoba Corporation. The contractor is a potential source of income for Governing Board Member Joseph Lyou, which qualifies for the remote interest exception of Section 1090 of the California Government Code. Dr. Lyou abstained from any participation in the making of the contract.

CLOSED SESSION - (*No Written Material*)

Wiese/3460

It is necessary for the Board to recess to closed session pursuant to Government Code section 54956.9(a) and 54956.9(d)(1) to confer with its counsel regarding pending litigation which has been initiated formally and to which the SCAQMD is a party. The actions are:

- California Nozzle Specialists, Inc. v. SCAQMD, Los Angeles County Superior Court Case No. BS152037 (Public Records Act);
- CBE, CCAT v. EPA, U.S. Court of Appeals, Ninth Circuit, Case No. 12-72358 (1315);
- Communities for a Better Environment, et al. v. U.S. EPA, et al., U.S. Court of Appeals, Ninth Circuit, Case No. 13-70167 (Sentinel);
- People of the State of California, ex rel SCAQMD v. Exide Technologies, Inc., Los Angeles Superior Court Case No. BC533528;
- In the Matter of SCAQMD v. Exide Technologies, Inc., SCAQMD Hearing Board Case No. 3151-29 (Order for Abatement);
- Exide Technologies, Inc., Petition for Variance, SCAQMD Hearing Board Case No. 3151-31;
- In re: Exide Technologies, Inc., U.S. Bankruptcy Court for the District of Delaware Case No. 13-11482 (KJC) (Bankruptcy case);
- Fast Lane Transportation, Inc. et al. v. City of Los Angeles, et al., Contra Costa County Superior Court Case No. MSN14-0300 (formerly South Coast Air Quality Management District v. City of Los Angeles, et al., Los Angeles Superior Court Case No. BS 143381) (SCIG);
- Friedman Marketing v. SCAQMD, California Court of Appeal, Second Appellate District, Case No. B249836 (Rule 461);
- Friends of the Eel River v. North Coast Railway Authority, California Supreme Court Case No. S222472 (amicus brief);
- Friends of the Fire Rings v. SCAQMD, San Diego Superior Court, North County, Case No. 37-2014-00008860-CU-WM-NC (Nov. 26, 2013; transferred March 20, 2014);
- Petition for Declaratory Order by U.S. Environmental Protection Agency, Surface Transportation Board Docket No. FD 35803 (Railroad Rules);
- Physicians for Social Responsibility, et al. v. U.S. EPA, U.S. Court of Appeals, Ninth Circuit, Case No. 12-70016 (Monitoring);
- Physicians for Social Responsibility, et al. v. U.S. EPA, U.S. Court of Appeals, Ninth Circuit, Case No. 12-70079 (PM2.5);

- Physicians for Social Responsibility, et al. v. U.S. EPA, U.S. Court of Appeals, Ninth Circuit, Case No. 14-73362 (1-Hour ozone);
- SCAQMD v. U.S. EPA, U.S. Court of Appeals, Ninth Circuit, Case No. 13-73936 (Morongo Redesignation);
- Sierra Club, et al. v. U.S. EPA, U.S. District Court for Northern District of California Case No. 3:14-CV-04596 (PM2.5 designation to serious); and
- WildEarth Guardians v. U.S. EPA, D.C. Circuit Court Case No. 14-1145 (PM2.5 moderate designation).

It is also necessary for the Board to recess to closed session pursuant to Government Code section 54956.9(a) and 54956.9(d)(4) to consider initiation of litigation (two cases) and pursuant to Government Code section 54956.9(b) due to significant exposure to litigation (one case).

In addition, it is necessary for the Board to recess to closed session pursuant to Government Code section 54957.6 to confer regarding upcoming labor negotiations with:

- designated representatives regarding represented employee salaries and benefits or other mandatory subjects within the scope of representation [Negotiator: William Johnson; Represented Employees: SCAQMD Professional Employees Association].

ADJOURNMENT

PUBLIC COMMENTS

Members of the public are afforded an opportunity to speak on any listed item before or during consideration of that item. Please notify the Clerk of the Board, (909) 396-2500, if you wish to do so. All agendas are posted at SCAQMD Headquarters, 21865 Copley Drive, Diamond Bar, California, at least 72 hours in advance of the meeting. At the end of the agenda, an opportunity is also provided for the public to speak on any subject within the SCAQMD's authority. Speakers may be limited to three (3) minutes each.

Note that on items listed on the Consent Calendar and the balance of the agenda any motion, including action, can be taken (consideration is not limited to listed recommended actions). Additional matters can be added and action taken by two-thirds vote, or in the case of an emergency, by a majority vote. Matters raised under Public Comments may not be acted upon at that meeting other than as provided above.

Written comments will be accepted by the Board and made part of the record, provided 25 copies are presented to the Clerk of the Board. Electronic submittals to cob@aqmd.gov of 10 pages or less including attachment, in MS WORD, plain or HTML format will also be accepted by the Board and made part of the record if received no later than 5:00 p.m., on the Tuesday prior to the Board meeting.

ACRONYMS

AQIP = Air Quality Investment Program
AVR = Average Vehicle Ridership
BACT = Best Available Control Technology
Cal/EPA = California Environmental Protection Agency
CARB = California Air Resources Board
CEMS = Continuous Emissions Monitoring Systems
CEC = California Energy Commission
CEQA = California Environmental Quality Act
CE-CERT =College of Engineering-Center for Environmental Research and Technology
CNG = Compressed Natural Gas
CO = Carbon Monoxide
CTG = Control Techniques Guideline
DOE = Department of Energy
EV = Electric Vehicle
FY = Fiscal Year
GHG = Greenhouse Gas
HRA = Health Risk Assessment
IAIC = Interagency AQMP Implementation Committee
LEV = Low Emission Vehicle
LNG = Liquefied Natural Gas
MATES = Multiple Air Toxics Exposure Study
MOU = Memorandum of Understanding
MSERCs = Mobile Source Emission Reduction Credits
MSRC = Mobile Source (Air Pollution Reduction) Review Committee
NATTS =National Air Toxics Trends Station
NESHAPS = National Emission Standards for Hazardous Air Pollutants
NGV = Natural Gas Vehicle
NO_x = Oxides of Nitrogen
NSPS = New Source Performance Standards
NSR = New Source Review
PAMS = Photochemical Assessment Monitoring Stations
PAR = Proposed Amended Rule
PHEV = Plug-In Hybrid Electric Vehicle
PM_{10} = Particulate Matter $\leq$ 10 microns
$PM_{2.5}$ = Particulate Matter $\leq$ 2.5 microns
PON = Public Opportunity Notice
PR = Proposed Rule
RFP = Request for Proposals
RFQ = Request for Quotations
SCAG = Southern California Association of Governments
SIP = State Implementation Plan
SO_x = Oxides of Sulfur
SOON = Surplus Off-Road Opt-In for NO_x
SULEV = Super Ultra Low Emission Vehicle
TCM = Transportation Control Measure
ULEV = Ultra Low Emission Vehicle
U.S. EPA = United States Environmental Protection Agency
VOC = Volatile Organic Compound
VMT = Vehicle Miles Traveled
ZEV = Zero Emission Vehicle

Back to Agenda

BOARD MEETING DATE: February 6, 2015 AGENDA NO. 1

MINUTES: Governing Board Monthly Meeting

SYNOPSIS: Attached are the Minutes of the January 9, 2015 meeting.

RECOMMENDED ACTION:
Approve Minutes of the January 9, 2015 Board Meeting.

Saundra McDaniel,
Clerk of the Boards

SM:dg

FRIDAY, JANUARY 9, 2015

Notice having been duly given, the regular meeting of the South Coast Air Quality Management District Board was held at District Headquarters, 21865 Copley Drive, Diamond Bar, California. Members present:

William A. Burke, Ed.D., Chairman
Speaker of the Assembly Appointee

Mayor Dennis R. Yates, Vice Chairman
Cities of San Bernardino County

Mayor Michael D. Antonovich (left at 10:10 a.m.)
County of Los Angeles

Mayor Ben Benoit
Cities of Riverside County

Supervisor John J. Benoit
County of Riverside

Councilmember Joe Buscaino
City of Los Angeles

Councilmember Michael A. Cacciotti
Cities of Los Angeles County – Eastern Region

Supervisor Josie Gonzales (arrived at 9:15 a.m.)
County of San Bernardino

Dr. Joseph K. Lyou
Governor's Appointee

Councilmember Judith Mitchell
Cities of Los Angeles County – Western Region

Dr. Clark E. Parker, Sr.
Senate Rules Committee Appointee

Mayor Miguel A. Pulido
Cities of Orange County

Member absent:

Supervisor Shawn Nelson
County of Orange

CALL TO ORDER: Chairman Burke called the meeting to order at 9:05 a.m.

- Pledge of Allegiance: Led by Councilman Cacciotti.

- Opening Comments

  Councilman Cacciotti. Noted that he had an opportunity to meet with students from Cal State L.A. and view their progress on the redesigning of a vehicle to be the ultimate in energy-efficiency, as part of the EcoCAR 3 program, an advanced vehicle technology competition among 16 colleges and universities across the nation.

  Councilman Buscaino. Introduced a video that was made showing the SCAQMD gas lawnmower exchange for new electric models held in San Pedro on September 6, 2014.

  In response to Mayor Pulido's inquiry about the process for replacing older batteries in the exchanged lawnmowers, Dr. Wallerstein explained that staff would provide a briefing to the Technology Committee on the subject.

(Supervisor Gonzales arrived at 9:15 a.m., during opening comments)

- Presentation of Retirement Awards to Bobby Mendoza and Richard Watson

  Chairman Burke presented a retirement award to Bobby Mendoza, Supervising Air Quality Inspector, in recognition of 34 years of dedicated District service; and to Richard Watson, Supervising Air Quality Inspector, in recognition of 25 years of dedicated District service.

- Swearing In of Reappointed Board Member Ben Benoit

  Chairman Burke administered the oath of office to Ben Benoit, who was reappointed to the Board by the Riverside County City Selection Committee, for a term ending January 15, 2019.

CONSENT CALENDAR

1. Approve Minutes of December 5, 2014 Board Meeting

2. Set Public Hearings March 6, 2015 to Consider Amendments and/or Adoption to SCAQMD Rules and Regulations

   A. Amend Rule 1420.1 – Emission Standards for Lead and Other Toxic Air Contaminants from Large Lead-Acid Battery Recycling Facilities

Budget/Fiscal Impact

3. Execute Contracts to Conduct 2015 Lawn Mower Exchange Program and Transfer, Appropriate and Recognize Funds

4. Issue RFP to Verify Inventory of Atmospheric Pressure Relief Devices at Refineries and Check for Existence of Refinery Fuel Supply Line(s) that Bypass Fuel Monitors

5. Amend Existing Contracts for Legislative Representation in Washington, D.C.

6. Airing SCAQMD Governing Board Monthly Meetings on Local Public Affairs Channels

Action Items/No Fiscal Impact

7. Approve Memorandum of Agreement Among Division of Oil, Gas, and Geothermal Resources, CARB and SCAQMD Regarding Well Stimulation Treatments and Well Stimulation Treatment – Related Activities

8. Resolution to Support in Concept Salton Sea Restoration and Renewable Energy Initiative

Items 9 through 15 - Information Only/Receive and File

9. Legislative and Public Affairs Report

10. Hearing Board Report

11. Civil Filings and Civil Penalties Report

12. Lead Agency Projects and Environmental Documents Received by SCAQMD

13. Rule and Control Measure Forecast

14. Report of RFQs Scheduled for Release in January

15. Report on Major Projects for Information Management Scheduled to Start During Last Six Months of FY 2014-15

Agenda Item Nos. 2, 3, 4, 6, 7, 8, 13 and 15 were withheld for discussion and comment.

MOVED BY BUSCAINO, SECONDED BY CACCIOTTI, AGENDA ITEMS 1, 5, 9 THROUGH 12 AND 14 APPROVED AS RECOMMENDED, BY THE FOLLOWING VOTE:

AYES: Antonovich, B. Benoit, J. Benoit, Burke, Buscaino, Cacciotti, Gonzales, Lyou, Mitchell, Parker and Yates.

NOES: None.

ABSENT: Nelson and Pulido.

16. Items Deferred from Consent Calendar -

2. Set Public Hearings March 6, 2015 to Consider Amendments and/or Adoption to SCAQMD Rules and Regulations

A. Amend Rule 1420.1 – Emission Standards for Lead and Other Toxic Air Contaminants from Large Lead-Acid Battery Recycling Facilities

Susan Nakamura, Director of Strategic Initiatives, gave a presentation regarding the status of the proposed amendment to Rule 1420.1.

The following individuals addressed the Board on Item No. 2A.

Father John Moretta, Resurrection Church Boyle Heights, urged the Board to take any action that will reduce the amount of lead that is released into local communities, and noted that a lead emissions standard of zero should be the goal.

Tom Strang, Exide Technologies, noted that Exide is taking an active role in reducing emissions by installing $15 million worth of equipment and implementing a process risk reduction program approved by SCAQMD. He added that they expect to start utilizing this equipment upon completion of the project in the spring.

Mike Buckantz, Quemetco, noted their ongoing commitment to utilizing the cleanest technology available and urged for a more

stringent standard that will make significant reductions in lead emissions.

Submitted Written Comments:
John D. Dunlap III, on behalf of Exide Technologies

Dr. Wallerstein explained that staff believes that changing the testing mechanism for ambient measurement and lowering the trigger for a violation and also ensuring a mediation plan is implemented in a timely manner, along with the lowering of the stack emission requirement, will have a great impact at this time. He added that once the performance of Exide's upgraded system can be assessed, additional rule amendments can be considered.

Councilwoman Mitchell expressed support for a timely amendment of the rule to control ambient emissions which directly affect neighboring communities, with the intention of possibly revisiting the standards once the results of Exide's system improvements can be measured.

Mayor Yates expressed dismay at how Exide has handled the process of coming into compliance with the current standards, and noted the need to continue to monitor them even after the completion of their current projects.

Dr. Lyou cautioned against setting standards based upon what the affected facilities indicate that they can meet and instead the Board should continue to focus on rulemaking that protects public health and reduces air pollution; commented on the clear authority the District has for developing stricter standards than those in place by state law or by CARB; noted the extremely adverse health impacts associated with lead exposure and the Board's responsibility to ensure that exposure to lead is limited as much as possible; and requested that staff return to the Board in six months for possible consideration of a more stringent standard.

Dr. Wallerstein replied that staff would ensure that the adopting resolution for the amended rule include language regarding bringing the rule back to the Board for additional amendments if such stricter limits are feasible.

MOVED BY YATES, SECONDED BY PULIDO, AGENDA ITEM 2A APPROVED AS RECOMMENDED, BY THE FOLLOWING VOTE:

AYES: Antonovich, B. Benoit, Burke, Buscaino, Cacciotti, Gonzales, Lyou, Mitchell, Parker, Pulido and Yates.

NOES: None.

ABSENT: J. Benoit and Nelson.

3. Execute Contracts to Conduct 2015 Lawn Mower Exchange Program and Transfer, Appropriate and Recognize Funds

Jesse Marquez, Harbor Resident, addressed the Board expressing support for the continued funding of the Lawn Mower Exchange Program, from which he has directly benefited.

MOVED BY YATES, SECONDED BY PULIDO, AGENDA ITEM 3 APPROVED AS RECOMMENDED, BY THE FOLLOWING VOTE:

AYES: Antonovich, B. Benoit, Burke, Buscaino, Cacciotti, Gonzales, Lyou, Mitchell, Parker, Pulido and Yates.

NOES: None.

ABSENT: J. Benoit and Nelson.

4. Issue RFP to Verify Inventory of Atmospheric Pressure Relief Devices at Refineries and Check for Existence of Refinery Fuel Supply Line(s) that Bypass Fuel Monitors

The following individuals addressed the Board on Item No. 4.

Drew Wood, California Kids IAQ, and Jesse Marquez, Coalition for a Safe Environment, suggested that the Board adopt a proposal that would require the refineries to pay for any costs associated with the inventory.

Dr. Tom Williams, Sierra Club, questioned whether some of the refineries have been able to bypass their meters and suggested that they be held criminally accountable for providing accurate drawings during the permitting process.

Dr. Wallerstein clarified that this project will be funded from a mitigation plan fund that refineries have paid into for excessive flaring.

Councilman Cacciotti expressed support for this type of control system in order to have an additional check-and-balance on refinery operations.

In response to Mayor Mitchell's inquiry about whether the drawings are in a digital format and about monitoring at the facilities, Mohsen Nazemi, DEO/Engineering and Compliance, responded that the drawings do come in various forms, but their accuracy is what is of concern. In regards to monitoring, there is continuous monitoring in place at refineries, but this method seeks to have an additional way to monitor the operations and will be especially helpful for areas that are inaccessible for inspectors.

Dr. Parker confirmed the importance of having additional monitoring available, and suggested this method be used on an ongoing basis, to ensure compliance by the refineries.

Dr. Wallerstein noted that the intent of this RFP is a one-time device/component inventory, but if the results indicate a need for additional inspections, staff would prepare an additional item for the Board's consideration.

MOVED BY LYOU, SECONDED BY GONZALES, AGENDA ITEM 4 APPROVED AS RECOMMENDED, BY THE FOLLOWING VOTE:

AYES:	B. Benoit, J. Benoit, Burke, Buscaino, Cacciotti, Gonzales, Lyou, Mitchell, Parker, Pulido and Yates.
NOES:	None.
ABSENT:	Antonovich and Nelson.

(Supervisor Antonovich left at 10:10, during discussion of Item No. 4.)

6. Airing SCAQMD Governing Board Monthly Meetings on Local Public Affairs Channels

Dr. Tom Williams, commented on the importance of airing the meetings throughout the Basin and suggested also having committee meetings and hearings available on public access channels.

Mayor Yates noted that the District's Media staff has been working diligently to get the meetings broadcast by reaching out to a multitude of public access channels and attempting to work around their requirements for length of the airing and other factors.

MOVED BY CACCIOTTI, SECONDED BY GONZALES, AGENDA ITEM 6 APPROVED AS RECOMMENDED, BY THE FOLLOWING VOTE:

AYES:	B. Benoit, J. Benoit, Burke, Buscaino, Cacciotti, Gonzales, Lyou, Mitchell, Parker, Pulido and Yates.
NOES:	None.
ABSENT:	Antonovich and Nelson.

7. Approve Memorandum of Agreement Among Division of Oil, Gas, and Geothermal Resources, CARB and SCAQMD Regarding Well Stimulation Treatments and Well Stimulation Treatment – Related Activities

The following individuals addressed the Board on Item No. 7.

Dr. Tom Williams, Citizens Commission for a Safe Community, noted that the MOA is lacking a provision for public notifications and reporting and questioned whether H2S would be monitored for and regulated; and also inquired about the enforceability of the agreement.

Yvonne Watson, Resident of Montebello, expressed concerns about the air quality as a result of the oil field in Montebello, how these well activities affect the health and livelihood of those in the community, as well as the lack of notification to neighboring residents; and urged the Board to consider regulating H2S gas and methane.

Jesse Marquez, Coalition for a Safe Environment, requested that these provisions be part of the Title V permit process, so the community can access all of the information together; expressed a concern about the lack of sufficient notification to nearby residents prior to when drilling activities will occur.

Councilmember Buscaino confirmed that the wells are in close proximity to residents in Wilmington and noted that this MOA will help to address some of the concerns that have been raised.

Dr. Wallerstein explained that this item is now required under state law and it is intended to improve coordination between DOGGR and CARB and the local air districts, as well as to define our regulatory authority and to summarize a number of the current activities; and that the document does not affect the District's rules and regulations or authority over how to deploy staff. He added that within the next few months staff will be providing a report on the implementation of the Board's policies through Rule 1148.2 and the Board could, at that time, decide to strengthen notification requirements or other items as they see fit.

In response to Dr. Parker's question about the terms of the MOU, Dr. Wallerstein confirmed that the MOU is mandatory and there are provisions included regarding the potential need to renegotiate portions of it with DOGGR and CARB.

Councilman Cacciotti suggested the preparation of a quick reference sheet that could be distributed to the various municipalities to utilize when they receive inquiries regarding which agency to contact for a noise, odor or other complaint related to the drilling process.

Dr. Wallerstein confirmed that staff would prepare a document with that information for distribution as well as to be posted on the SCAQMD webpage.

In response to Dr. Lyou's request that staff communicate with Ms. Watson about the current odor complaint process, Dr. Wallerstein confirmed that they would do so, and also address her concern about methane by explaining the effort underway by CARB to further regulate methane.

Dr. Lyou commented on the importance of continuing to work on affordable community-based monitoring which would be a great asset in those communities that are experiencing concerns about the H2S and methane levels.

MOVED BY CACCIOTTI, SECONDED BY MITCHELL, AGENDA ITEM 7 APPROVED AS RECOMMENDED, BY THE FOLLOWING VOTE:

AYES: B. Benoit, J. Benoit, Burke, Buscaino, Cacciotti, Gonzales, Lyou, Mitchell, Parker and Yates.

NOES: None.

ABSENT: Antonovich, Nelson and Pulido.

8. Resolution to Support in Concept Salton Sea Restoration and Renewable Energy Initiative

Dr. Tom Williams, Sierra Club Water Committee, raised concerns about who will be responsible for a dust reduction program and mitigation measures at the Salton Sea.

MOVED BY CACCIOTTI, SECONDED BY GONZALES, AGENDA ITEM 8 APPROVED AS RECOMMENDED, ADOPTING RESOLUTION NO. 15-01 SUPPORTING IN CONCEPT, THE SALTON SEA RESTORATION AND RENEWABLE ENERGY INITIATIVE, BY THE FOLLOWING VOTE:

AYES: B. Benoit, J. Benoit, Buscaino, Cacciotti, Gonzales, Lyou, Mitchell, Parker and Yates.

NOES: None.

ABSENT: Antonovich, Burke, Nelson and Pulido.

13. Rule and Control Measure Forecast

Dr. Tom Williams, Citizens Coalition for a Safe Community, urged that more meetings be scheduled and community outreach be performed regarding Rules 1148.1 and 1148.2.

MOVED BY MITCHELL, SECONDED BY CACCIOTTI, AGENDA ITEM 13 APPROVED AS RECOMMENDED, BY THE FOLLOWING VOTE:

AYES: B. Benoit, J. Benoit, Cacciotti, Gonzales, Lyou, Mitchell, Parker and Yates.

NOES: None.

ABSENT: Antonovich, Burke, Buscaino, Nelson and Pulido.

15. Report on Major Projects for Information Management Scheduled to Start During Last Six Months of FY 2014-15

Dr. Tom Williams expressed the need for more programs geared towards data management and reporting.

MOVED BY YATES, SECONDED BY CACCIOTTI, AGENDA ITEM 15 APPROVED AS RECOMMENDED, BY THE FOLLOWING VOTE:

AYES: B. Benoit, J. Benoit, Burke, Cacciotti, Gonzales, Lyou, Mitchell, Parker, Pulido and Yates.

NOES: None.

ABSENT: Antonovich, Buscaino and Nelson.

BOARD CALENDAR

17. Administrative Committee

18. Legislative Committee

19. California Air Resources Board Monthly Report

MOVED BY YATES, SECONDED BY MITCHELL, AGENDA ITEMS 17 THROUGH 19 APPROVED AS RECOMMENDED, RECEIVING AND FILING THE COMMITTEE AND CARB REPORTS, AND ADOPTING THE POSITIONS ON LEGISLATION AS SET FORTH BELOW, BY THE FOLLOWING VOTE:

AYES: B. Benoit, J. Benoit, Burke, Cacciotti, Gonzales, Lyou, Mitchell, Parker, Pulido and Yates.

NOES: None.

ABSENT: Antonovich, Buscaino and Nelson.

Agenda Item	**Recommendation**
H.R. 5101 (Hahn) National Freight Network Trust Fund Act of 2014	Develop Proposed Language and Return to Committee
H.R. 5624 (Lowenthal) Economy in Motion: The National Multimodal and Sustainable Freight Infrastructure Act	Support and Recommend Amendments

OTHER BUSINESS

20. Establish BP/SCAQMD Public Benefits Oversight Special Revenue Fund

Dr. Wallerstein explained that this action is to establish a secure account to hold leftover funds from a BP refinery settlement, as they no longer operate a refinery within the District.

MOVED BY YATES, SECONDED BY GONZALES, AGENDA ITEM NO. 20 APPROVED AS RECOMMENDED BY STAFF, BY THE FOLLOWING VOTE:

AYES:	B. Benoit, J. Benoit, Burke, Buscaino, Cacciotti, Lyou, Gonzales, Mitchell, Parker and Yates.
NOES:	None.
ABSENT:	Antonovich, Nelson and Pulido.

PUBLIC COMMENT PERIOD – (Public Comment on Non-Agenda Items, Pursuant to Government Code Section 54954.3)

Linda Hess, Urban Harvester, highlighted her non-profit organization, based in South Pasadena, which facilitates feeding those in need by utilizing excess, edible food from local businesses, resulting in less food waste and less pollution by the transporting and disposal of such waste. She noted that in 2014, Urban Harvester redistributed 20 tons of food that would have otherwise ended up in landfills.

Jesse Marquez complained about the conduct of SCAQMD staff regarding a recent grant application process where his organization was eliminated from the project after spearheading a partnership with the SCAQMD and UCLA. He distributed a letter detailing the situation, and requested that the matter be investigated.

Chairman Burke requested that the legal staff investigate this matter and provide a response to Mr. Marquez and the Governing Board.

Drew Wood, California Kids IAQ, explained another situation where he felt staff did not effectively work with a public health organization and encouraged staff to work cooperatively with community members.

Allen Hernandez, Sierra Club
Marina Barragan, Sierra Club
Elijah Cervantes, Resident of Coachella Valley
Jason Martinez, Sierra Club
Selene Hernandez, Resident of Coachella Valley
Francisca Pliego, MEChA
Javier Vizcarra, Sierra Club

Addressed the Board regarding the development of the 2016 Air Quality Management Plan, stressing the need for the next AQMP to lead to better air quality for local communities and detailing their experiences with poor air quality, including the negative health effects suffered by their family members. They also expressed an interest in actively participating in the AQMP development process.

Chairman Burke thanked the attendees for their testimony and requested that they continue to take an active role in working with the agency and bringing areas of improvement to staff's attention.

Alberto Reyes Tovar, MECha, commented on the negative impact of goods movement on local communities and urged for the continued requirement for more environmentally-friendly trucks.

Councilwoman Mitchell noted that CARB recognizes the large impact that the Imperial County and Coachella Valley regions are subject to as a result of trucks traveling to California from Mexico, and is therefore working with Mexico to develop a Memorandum of Understanding to reduce those emissions.

Doelorez Mejia, Eastside Coalition Against Exide Toxic Technologies, urged the Board to enact the strictest possible standards under Rule 1420.1 and not allow Exide Technologies to operate until they have fully remediated toxic emissions. She added that after listening to previous comments about the upcoming AQMP, it is imperative that the Board ensures the next Plan includes measures that address notification, regulation and enforcement to work towards protecting local residents.

Dr. Lyou suggested that staff schedule a briefing in the Coachella Valley to receive input about any areas of concern to local residents, and to provide information on current issues pertinent to the region.

Supervisor Benoit expressed appreciation to those who traveled to the meeting to provide comments and noted that he would like to organize a visit to speak with students at Desert Mirage High School. He encouraged the community organizers to continue their involvement with the District by providing input and communicating their concerns to his office.

Supervisor Gonzales stressed the importance of providing ample and widespread notice of all AQMP working group meetings and also to schedule meetings in various communities in order to facilitate involvement from all stakeholders.

Dr. Tom Williams, noted the need for literature to be produced in Spanish as well as Spanish translators to be present at community meetings. He explained that the SR710 North Extension EIR/EIS is due to be released next week and he would like staff to review the pertinent portions related to air quality issues.

CLOSED SESSION

The Board recessed to closed session at 11:30 a.m., pursuant to Government Code sections:

- 54956.9(a) and 54956.9(d)(1) to confer with its counsel regarding pending litigation which has been initiated formally and to which the SCAQMD is a party. The actions are:

  People of the State of California, ex rel SCAQMD v. Exide Technologies,Inc., Los Angeles Superior Court Case No. BC533528;

  In re: Exide Technologies, Inc., U.S. Bankruptcy Court for the District of Delaware Case No. 13-11482 (KJC) (Bankruptcy case);

  Friends of the Eel River v. North Coast Railway Authority, California Supreme Court Case No. S222472 (seek leave to file amicus brief); and

  Petition for Declaratory Order by U.S. Environmental Protection Agency, Surface Transportation Board Docket No. FD 35803 (Railroad Rules).

- 54957.6 to confer regarding upcoming labor negotiations with:

  designated representatives regarding represented employee salaries and benefits or other mandatory subjects within the scope of representation [Negotiator: William Johnson; Represented Employees: SCAQMD Professional Employees Association].

Following Closed Session, General Counsel Kurt Wiese announced that a report of any reportable actions taken in closed session will be filed with the Clerk of the Board and made available upon request.

ADJOURNMENT

There being no further business, the meeting was adjourned by Kurt Wiese at 11:55 a.m.

The foregoing is a true statement of the proceedings held by the South Coast Air Quality Management District Board on January 9, 2015.

Respectfully Submitted,

Denise Garzaro
Senior Deputy Clerk

Date Minutes Approved: _____

_____
Dr. William A. Burke, Chairman

ACRONYMS

AQMP = Air Quality Management Plan
CARB = California Air Resources Board
CEQA = California Environmental Quality Act
CNG = Compressed Natural Gas
DOGGR = Division of Oil, Gas, and Geothermal Resources
EIR = Environmental Impact Report
EIS = Environmental Impact Study
FY = Fiscal Year
RFP = Request for Proposals
RFQ = Request for Quotations
U.S. EPA = United States Environmental Protection Agency

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 2

PROPOSAL: Amend Contract with Norton Engineering for NOx RECLAIM Technical Evaluation

SYNOPSIS: This action is to amend the contract with Norton Engineering to provide supplemental technical evaluation in support of the NOx RECLAIM rule amendment process. The current contract for technical support was signed in September 2014 at a cost not to exceed $75,000. Norton Engineering has satisfactorily completed the tasks outlined in the current contract. The proposed amendment to the Statement of Work would add $12,000 to the contract total, thus requiring Board approval.

COMMITTEE: Stationary Source, January 23, 2015, Recommended for Approval

RECOMMENDED ACTION:
Authorize the Executive Officer to amend the contract with Norton Engineering for NOx RECLAIM Technical Evaluation Support for an additional amount not to exceed $12,000 from the FY 2014-15 Budget.

Barry R. Wallerstein, D.Env.
Executive Officer

EC:PF:JC

Background
Staff is currently evaluating NOx RECLAIM emissions limits for the source categories covered under Rule 2002. The rule amendment is seeking to determine Best Available Retrofit Control Technology (BARCT) for 12 sources categories. The draft BARCT evaluation was completed in July 2014 and the set of proposed BARCT NOx emissions limits were presented to the RECLAIM stakeholders. Due to the complexity of the

analysis, estimated costs associated with rule implementation and stakeholder recommendations, the SCAQMD entered into a contract with Norton Engineering to review the refinery BARCT assessment of the staff proposal. Norton Engineering signed the contract in September 2014 and satisfactorily completed the assessment, including field visits to targeted sources, in December 2014.

Proposal

Staff is recommending amending the contract with Norton Engineering to provide supplemental technical evaluation in support of the NOx RECLAIM rule amendment. Specifically, Norton Engineering will provide a set of refinery specific reports and supporting documentation. Norton Engineering will also provide consultation where necessary to assist staff in responding to stakeholder inquiries on the BARCT analysis and cost effectiveness calculations.

Sole Source Justification

The criteria for a sole source award of contracts is addressed in Section VIII of the Procurement Policy and Procedures. Subsections (B)(2)(c)(1) and (B)(2)(c)(2) cite the unique experience and capabilities of the contractor and the use of proprietary technology as sole source criteria, respectively. The proposed project will supplement the analysis already conducted by Norton Engineering based on their expertise in refinery operations and pollution control equipment. The project will require Norton's proprietary software to disaggregate the process data in a format that is understandable to the operators and does not create further confidentiality issues. Furthermore, in order to maintain a timely rule development process and meet its critical schedule, it is desirable to keep the analysis with Norton Engineering who has the greatest familiarity with the data and past analyses.

Resource Impacts

Funds for this project, in an amount not to exceed $12,000, are available in the Planning, Rule Development and Area Sources FY 2014-15 Budget, Professional and Special Services account.

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 3

PROPOSAL: Recognize Funds, Adopt Resolution to Extend Caltrans Grant Agreement, and Execute and Amend Contracts

SYNOPSIS: On February 7, 2014, the Board recognized U.S. EPA funds for diesel emissions reduction projects under the Diesel Emissions Reduction Act (DERA). This action is to recognize $110,627 in additional Fiscal Year 13 (FY13) DERA funds into the Lower-Emission School Bus Fund (33) and execute contracts totaling $825,000 from the Lower-Emission School Bus Fund (33) to replace diesel school buses with electric buses. This action is also to adopt a resolution to extend a Caltrans grant agreement and amend contracts to reallocate unused funds for replacement of heavy-duty diesel trucks with CNG trucks totaling $350,000 from the Proposition 1B-Goods Movement Program Fund (81). Finally, this action is to amend a contract at no additional cost under the Carl Moyer Program.

COMMITTEE: Technology, January 23, 2015; Recommended for Approval

RECOMMENDED ACTIONS:

A. Recognize upon receipt $110,627 of additional FY13 DERA funds from the U.S. EPA into the Lower-Emission School Bus Fund (33) to cosponsor replacement of diesel school buses with electric school buses.

B. Authorize the Chairman to execute the following contracts from the Lower-Emission School Bus Fund (33) (includes $110,627 in DERA funds plus unallocated monies in Fund 33):
   1. Colton Joint Unified School District to replace two diesel school buses with electric school buses in an amount not to exceed $550,000 (Up to $104,000 of this funding will be from the U.S. EPA DERA grant); and
   2 Los Angeles Unified School District to replace one diesel school bus with an electric school bus in an amount not to exceed $275,000 (Up to $52,000 of this funding will be from the U.S. EPA DERA grant).

C. Authorize the Executive Officer to reimburse the General Fund for additional administrative expenditures funded by the DERA grant for project implementation in an amount not to exceed $6,627 from the Lower-Emission School Bus Fund (33).

D. Adopt a resolution approving a request to Caltrans to extend the agreement funding replacement of heavy-duty diesel trucks with natural gas trucks.

E. Authorize the Chairman to amend the following contracts from the Proposition 1B-Goods Movement Program Fund (81) to reallocate unused Caltrans funds:
   1. City of Los Angeles adding $125,000 to replace five diesel solid waste collection trucks with CNG solid waste collection trucks for a new total amount not to exceed $375,000;
   2. USA Waste adding $100,000 to replace four solid waste collection trucks with CNG solid waste collection trucks for a new total amount not to exceed $275,000;
   3. Ware Disposal Co., Inc., adding $75,000 to replace three diesel solid waste collection trucks with CNG solid waste collection trucks for a new total amount not to exceed $150,000; and
   4. Waste Management Collection and Recycling, Inc., adding $50,000 to replace two solid waste collection trucks with CNG solid waste collection trucks for a new total amount not to exceed $175,000.

F. Authorize the Chairman to amend a contract with Catalina Sea Ranch at no additional cost to repower one main and two auxiliary engines of a marine vessel instead of two main and one auxiliary engines under the Carl Moyer Program.

Barry R. Wallerstein, D. Env.
Executive Officer

MMM:FM:AO:RC

Background

FY13 DERA School Bus Replacement Project

On February 7, 2014, the Board recognized $391,613 in U.S. EPA funds for diesel emissions reduction projects under the Diesel Emissions Reduction Act (DERA) and awarded contracts to replace eight diesel buses with CNG buses, convert two diesel buses to battery powered buses, and replace one diesel bus with a new electric bus. On August 21, 2014, SCAQMD received a supplemental $110,627 award for FY13 for three additional diesel to electric school bus replacement projects. To utilize these funds, staff contacted seven school districts that had formerly expressed interest in electric school buses from a previously released program announcement. Two school districts have indicated their commitment to replace a total of three diesel buses with electric buses.

U.S. DOT/Caltrans Solid Waste Collection Vehicle Replacement Project

On February 3, 2012, following a solicitation process, the Board awarded contracts to 11 waste collection companies to replace 72 diesel trucks with new natural gas trucks under a U.S. DOT/Caltrans grant. A total of 58 diesel trucks have been replaced with new natural gas trucks. In recent discussions, however, some of the companies indicated that they had not initiated all of the truck replacements and would be unable to complete the remaining 14 truck replacements within the time allowed by Caltrans. Caltrans has directed staff to either request a grant extension, or drawdown all funds by June 30, 2015, to avoid de-obligation of funds. Staff reached out to all of the companies that had completed their originally awarded truck replacements to determine any interest in additional truck replacements in order to utilize the unused funds. Three companies indicated their willingness to replace 35 additional diesel trucks with natural gas trucks. The 35 trucks were ranked by cost effectiveness to establish a new list of eligible trucks and the top ranked 14 were selected. On October 24, 2014, staff submitted a request to Caltrans to extend the grant funding deadlines to December 31, 2016. As part of this request, SCAQMD is required to provide a Board resolution authorizing the requested extension.

Carl Moyer Project

On October 4, 2013, the Board awarded Catalina Sea Ranch a contract to repower two main engines and one auxiliary engine on a marine vessel under the "Year 16" Carl Moyer Program. The contractor has requested a no-cost amendment to the contract.

Outreach

In accordance with SCAQMD's Procurement Policy and Procedure, a public notice advertising Program Announcement PA#2012-13 and inviting bids was published in the Los Angeles Times, the Orange County Register, the San Bernardino Sun, and Riverside County's Press Enterprise newspapers to leverage the most cost-effective method of outreach to the South Coast Basin.

Additionally, potential bidders may have been notified utilizing SCAQMD's own electronic listing of certified minority vendors. Notice of the RFP/RFQ has been e-mailed to the Black and Latino Legislative Caucuses and various minority chambers of commerce and business associations, and placed on the Internet at SCAQMD's website (http://www.aqmd.gov).

Both the school districts and waste collection companies had previously participated in competitive bids and had received awards under those solicitations. On July 10, 2014, a notice was sent to seven school districts inviting interest in electric bus replacements. Public notification was not made as only school districts were eligible and only those who had expressed interested in electric bus replacements were invited to participate. For the waste collection companies, only those who had expended all their competitively awarded funds were contacted to determine interest, and all 35 proposed trucks from

those contractors were ranked based on cost effectiveness to award the 14 truck replacements.

Proposal

FY13 DERA School Bus Replacement Project

This action is to recognize the additional FY13 DERA award of $110,627 into the Lower-Emission School Bus Fund (33) and to award two contracts from Fund 33. Colton Joint Unified School District will replace two diesel school buses with electric school buses and the Los Angeles Unified School District will replace one diesel school bus with an electric school bus.

U.S. DOT/Caltrans Solid Waste Collection Vehicle Replacement Project

This action is to adopt a resolution (attached) approving a request to Caltrans to extend the agreement funding replacement of heavy-duty diesel trucks with natural gas trucks through December 31, 2016. This action is to also amend contracts to reallocate unused funds for replacement of 14 diesel solid waste collection trucks with natural gas trucks. The City of Los Angeles will replace five additional trucks. USA Waste will replace four additional trucks. Ware Disposal Co., Inc. will replace three additional trucks. Finally, Waste Management Collection and Recycling, Inc. will replace two additional trucks.

Carl Moyer Project

This action is to also amend a contract with Catalina Sea Ranch at no additional cost to repower one main and two auxiliary engines of a marine vessel instead of two main and one auxiliary engines under the Carl Moyer Program. This change will better serve the technical operation of the vessel.

Benefits to SCAQMD

The successful implementation of these projects will provide direct emissions reductions for NOx, PM and GHG emissions through the replacement of older diesel vehicles with new low-emission natural gas and zero-emission electric vehicles. Since the vehicles and equipment funded under these programs will operate for many years, the emissions reductions will provide long-term benefits. For example, replacement of three diesel buses with electric buses is expected to reduce NO_x emissions by 0.72 tons per year and PM emissions by 0.03 tons per year.

Resource Impacts

FY13 DERA School Bus Replacement Project

Additional FY13 DERA funds will be recognized into the Lower-Emission School Bus Fund (33) in the amount of $110,627, and the proposed contracts with Colton Joint and Los Angeles Unified School Districts for 3 additional diesel to electric school bus replacements shall not exceed $825,000 from Fund 33. The $825,000 consists of $110,627 in DERA funds plus $714,373 in unallocated monies within the Lower-Emission School Bus Fund (33).

U.S. DOT/Caltrans Solid Waste Collection Vehicle Replacement Project
The total cost for this project is $4,130,000, with the four proposed contracts totaling $350,000 to be executed from the Proposition 1B-Goods Movement Program Fund (81). The $350,000 is funds previously recognized from Caltrans into Fund 81 but redirected from other contractors unable to use the funds.

Contractor	**Contractor Cost-Share**	**SCAQMD Funding (*requested*)**
City of Los Angeles	$1,500,000	$125,000
USA Waste	$1,120,000	$100,000
Ware Disposal Co., Inc.	$600,000	$75,000
Waste Management Collection and Recycling, Inc.	$560,000	$50,000
Total	$3,780,000	$350,000

Carl Moyer Project
The contract amendment for Catalina Sea Ranch is at no cost.

Attachment
Resolution Requesting Caltrans Extend Funding Agreement

Attachment

RESOLUTION NO. 15-

A Resolution of the South Coast Air Quality Management District Board Requesting the California Department of Transportation (Caltrans) to Extend Funding of Agreement

WHEREAS, under Health & Safety Code §40400 et seq., the South Coast Air Quality Management District (SCAQMD) is the local agency with the primary responsibility for the development, implementation, monitoring and enforcement of air pollution control strategies, clean fuels programs, and motor vehicle use reduction measures; and

WHEREAS, the SCAQMD is authorized by Health & Safety Code §40402, §40440 and §40448.5 to implement programs to reduce transportation emissions, including programs to encourage the use of alternative fuels and low-emission vehicles; develop and implement other strategies and measures to reduce air contaminants and achieve the state and federal air quality standards; and

WHEREAS, SCAQMD was awarded funds up to $1,799,612 from the U.S. Department of Transportation which is administered by Caltrans to replace heavy-duty diesel trucks with natural gas trucks; and

WHEREAS, Caltrans and SCAQMD have executed an Agreement implementing this project that requires funds to be spent by June 30, 2015; and

WHEREAS, SCAQMD has identified truck replacements that can be made with the awarded funds to fully expend the grant funds but this cannot be completed by June 30, 2015.

THEREFORE, BE IT RESOLVED that the Board of the South Coast Air Quality Management District, State of California, in regular session assembled on February 6, 2015, does hereby request that Caltrans extend the Agreement until December 31, 2016, and accepts that work begun in anticipation of receiving the extension must be completed with local funds if Caltrans does not agree to the extension.

BE IT FURTHER RESOLVED that the Executive Officer is authorized and directed to take all steps necessary to carry out this Resolution.

_____ _____

Date Clerk of the Board

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 4

PROPOSAL: Recognize Funds and Execute Contract for Heavy-Duty Advanced Technology Assessment

SYNOPSIS: NO_x emissions from on-road heavy-duty diesel trucks are the largest contributor to ozone and fine particulate air quality in the South Coast Air Basin. As such, there is a need to better understand and plan for the deployment of zero and near-zero emission advanced technologies in this sector. The Southern California Gas Company (SoCalGas) has expressed interest in cofunding a study that would help achieve this objective. This action is to recognize $250,000 from SoCalGas into the Clean Fuels Fund (31). This action is to also execute a contract with U.S. DOE's National Renewable Energy Laboratory to develop a detailed technology and economics-based assessment for the deployment of advanced heavy-duty vehicle technologies suitable in commercial fleet applications in an amount not to exceed $500,000 from the Clean Fuels Fund (31).

COMMITTEE: Technology, January 23, 2015; Recommended for Approval

RECOMMENDED ACTIONS:

1. Recognize, upon receipt, up to $250,000 into the Clean Fuels Fund (31) from the Southern California Gas Company (SoCalGas) to cosponsor the development of a detailed technology and economics-based assessment for the deployment of advanced heavy-duty vehicle technologies; and
2. Authorize the Chairman to execute a contract with the U.S. DOE's National Renewable Energy Laboratory (NREL) to develop a detailed technology and economics-based assessment for the deployment of advanced heavy-duty vehicle technologies in an amount not to exceed $500,000 from the Clean Fuels Fund (31).

Barry R. Wallerstein, D.Env.
Executive Officer

MMM:HH:DKS:DRC

Background

NO_x emissions from on-road heavy-duty diesel trucks are the largest contributor to ozone and fine particulate air quality in the South Coast Air Basin. To meet ozone ambient air quality standards by 2022, 2023 and 2032, there is a critical need to reduce NO_x emissions as early as possible. The Draft 2015 Clean Fuels Plan Update emphasizes the need for zero and near-zero emission technologies for the on-road heavy-duty vehicle sector. These areas include the development and demonstration of advanced alternative fuel and fuel cell-powered medium- and heavy-duty engines and vehicles. Recognizing that advanced technology vehicles have significant cost impacts and different performance characteristics compared to conventional vehicles, there is a need to better understand and plan for their deployment, taking into account vehicle operation and duty cycle, the overall economics of ownership of advanced technology vehicles, and the level of incentives and mandates necessary so that businesses can financially afford to use these vehicles. SoCalGas has expressed an interest in cofunding a study that would help achieve this objective.

Proposal

The proposed project will develop a Commercial Zero Emission Vehicle Assessment specific to this region. A detailed technology and economic-based assessment will be developed focusing on identifying barriers and opportunities to match advanced technology options to key commercial medium- and heavy-duty vehicle vocations in Southern California. The technology options to be evaluated include: battery-electric vehicles, fuel cell vehicles, catenary/induction electric propulsion systems, and CNG and LNG internal combustion engines and gas turbines. The project will evaluate the resulting impact on fleet emissions, vehicles acquisition and operation costs for different scenarios, including market impacts resulting from different types of incentives and mandates.

Phase I will result in a baseline "technology adoption" scenario for zero and near-zero emission vehicles, specific to this region's medium- and heavy-duty commercial vehicle fleets. This phase will also include the development of "total cost of ownership" and "adoption-rate" models that are populated with data from NREL's fleet DNA vocational vehicle duty-cycle database with an analysis of the compatibilities of candidate commercial vehicle technologies to meet the region's air quality goals and commercial vehicle requirements.

Phase II will focus on utilizing the modeling framework developed under Phase I to determine the impact on fleet emissions based on technology adoption rates. In addition, various deployment scenarios will be analyzed to understand the effects of policy and market drivers, and input parameter uncertainties/sensitivity analysis on achieving NO_x and greenhouse gas (GHG) goals through 2050. Under Phase II, the

"technology adoption" scenario will be enhanced through feedback from private and public stakeholders and the incorporation of non-economic and other market drivers and barriers.

This action is to recognize revenue from SoCalGas into the Clean Fuels Fund (31) and to execute a contract with NREL to develop an advanced technology assessment for on-road heavy-duty trucks from the Clean Fuels Fund (31).

Sole Source Justification
Section VIII.B.2 of the Procurement Policy and Procedure identifies provisions under which a sole source award may be justified. This request for a sole source award is made under provision B.2.d.: other circumstances exist which in the determination of the Executive Officer require such waiver in the best interest of the SCAQMD. This request for sole source award is made under provision B.2.d(1): projects involving cost sharing by multiple sponsors, and provision B.2.d(8): research and development efforts with educational institutions or nonprofit organizations.

NREL, the only federal laboratory dedicated to the research, development, commercialization and deployment of renewable energy and energy efficiency technologies, will be the prime contractor for this project. NREL has managed several projects involving testing and development of engines and vehicles with an emphasis on emissions, alternative fuels and related technologies. NREL, a nonprofit organization, has supported SCAQMD, U.S. EPA, CARB and others on a variety of projects related to technology analysis, engine and vehicle testing, engine and combustion data acquisition and analysis and alternative fuels technologies.

Benefits to SCAQMD
The proposed project is listed in the *Draft 2015 Clean Fuels Plan Update* under several technology categories including "Electric and Hybrid Vehicle Technologies and Infrastructure," "Hydrogen and Fuel Cell Technologies and Infrastructure" and "Engine Systems." Results from such an evaluation would provide valuable information to local, state and federal policy makers to identify the optimum mix of mandates and incentives to achieve maximum deployment of these advanced technology vehicles. The proposed project will help expedite commercialization and increase the availability of zero and near-zero emission heavy-duty vehicles.

Resource Impacts
The total cost for the proposed project with NREL is $500,000 from the Clean Fuels Fund (31). The $500,000 includes $250,000 in anticipated revenue from SoCalGas, which will be recognized into the Clean Fuels Fund (31).

Sufficient funds are available from the Clean Fuels Fund (31), established as a special revenue fund resulting from the state-mandated Clean Fuels Program. The Clean Fuels Program, under Health and Safety Code Sections 40448.5 and 40512 and Vehicle Code Section 9250.11, establishes mechanisms to collect revenues from mobile sources to support projects to increase the utilization of clean fuels, including the development of the necessary advanced enabling technologies. Funds collected from motor vehicles are restricted, by statute, to be used for projects and program activities related to mobile sources that support the objectives of the Clean Fuels Program.

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 5

PROPOSAL: Execute Contracts for Advanced Optical Remote Sensing Technologies at Refineries, Other VOC Sources and Marine Vessels

SYNOPSIS: Recent advances in optical remote sensing (ORS) technology have made it possible to quantify fugitive emissions from an entire refinery complex and other sources. In September 2014, an RFP was issued to conduct a series of measurements intended to fully characterize and quantify fugitive and stack emissions from large refineries, other important VOC sources and marine vessels and to develop remote sensing technologies with the intent of providing real-time data capability. Several proposals were received from different contractors and evaluated to select the most competitive bids. This action is to execute contracts with multiple contractors employing a variety of different advanced ORS technologies in an amount not to exceed $1,100,805 from the Rule 1118 Mitigation Fund (54).

COMMITTEE: Technology, January 23, 2015; Recommended for Approval

RECOMMENDED ACTIONS:
Authorize the Chairman to execute the following contracts from the Rule 1118 Mitigation Fund (54):

A. FluxSense AB (FluxSense) in an amount not to exceed $511,861 to conduct three measurement projects intended to better characterize and quantify fugitive and stack emissions from large refineries, small point sources and marine vessels and improve current emission inventory estimates (Projects 1 through 3 in Table 1);

B. National Physical Laboratory (NPL) in an amount not to exceed $288,762 to conduct validation measurements on a refinery and a subset of small point sources;
C. Atmosfir Optics (Atmosfir) in an amount not to exceed $145,000 to conduct validation measurements on a refinery; and
D. Kassay Field Services, Inc. (Kassay) in amount not to exceed $155,182 to conduct validation measurements on a subset of small point sources.

Barry R. Wallerstein, D.Env.
Executive Officer

MMM:LT:AP

Background
On September 5, 2014, the Board issued RFP #P2014-07 to solicit proposals for a series of three measurement and evaluation projects to better characterize and quantify fugitive and stack emissions from large refineries and other important sources of VOCs (e.g., gas stations, oil wells, marine vessels, barges and railyards) and to improve current emission inventory estimates (Projects 1 through 3; Table 1). RFP #P2014-07 was also to further develop spectroscopic techniques and capabilities for continuous near-real time emission monitoring (Projects 4 and 5 in Table 1). This RFP sought qualified, independent vendors, academic institutions, national laboratories and other public and private organizations with proven expertise in developing, manufacturing, installing, operating and maintaining advanced Optical Remote Sensing (ORS) technologies.

Outreach
In accordance with SCAQMD's Procurement Policy and Procedure, a public notice advertising the RFP/RFQ and inviting bids was published in the Los Angeles Times, the Orange County Register, the San Bernardino Sun, and Riverside County's Press Enterprise newspapers to leverage the most cost-effective method of outreach to the South Coast Basin.

Additionally, potential bidders may have been notified utilizing SCAQMD's own electronic listing of certified minority vendors. Notice of the RFP/RFQ has been e-mailed to the Black and Latino Legislative Caucuses and various minority chambers of commerce and business associations, and placed on the Internet at SCAQMD's website (http://www.aqmd.gov).

Bid Evaluation
Twenty-one proposals were received from seven different contractors in response to this RFP. All proposals were reviewed and evaluated by a diverse, technically qualified panel of experts comprised of an SCAQMD Assistant Deputy Executive Officer, Quality Assurance Manager and Program Supervisor as well as BAAQMD's Director of Technical Services and a U.S. EPA Research Environmental Scientist, in accordance with specific criteria contained in the RFP. The panel consisted of five Caucasian males.

Based on technical and cost considerations, FluxSense was selected as the most qualified contractor to conduct Projects 1 through 3 (Table 2). In addition, the panel strongly recommended conducting validation measurements using different ORS methods to better evaluate the accuracy and reliability of the FluxSense emission data. In an effort to provide the recommended validation but also allow for a comprehensive comparison between different ORS methods, three other technically qualified contractors - National Physical Laboratory (NPL), Atmosfir Optics (Atmosfir) and Kassay Field Services, Inc. (Kassay) were selected. Staff was able to identify additional funding to complete these important validation measurements. The next section summarizes the strategies and techniques that have been chosen by the panel to accomplish the goals and objectives of Projects 1 through 3 in Table 1.

Proposal
Project 1: Quantification of Fugitive Emissions from Large Refineries
FluxSense will conduct a comprehensive five-week study at five different refineries in the Los Angeles Basin to characterize and quantify total facility-wide emissions of methane, non-methane VOCs (i.e., alkanes, BTEX and alkenes), nitrogen oxides (NO_x), and sulfur dioxide (SO_2) using Solar Occultation Flux (SOF), Differential Optical Absorption Spectroscopy (DOAS) and Fourier Transformed InfraRed (FTIR) measurements on a mobile platform. ORS measurements will be complemented by wind data from ground wind sensors and from a wind LIDAR that will be procured by SCAQMD as part of this fence-line monitoring project. The total emission data will be compared to the reported annual emission inventories. Any discrepancies between reported annual inventories and measured emissions will be further investigated to identify the specific emission sources. These optical techniques will be validated by a controlled release exercise in the vicinity of one of the targeted refineries. Measurements will be carried out primarily at the fence-line of the selected refineries but also inside the facilities to identify specific emission sources and to further validate the fence-line data. The SCAQMD will work with the refineries and other local authorities to facilitate the measurements.

To validate the emissions flux estimations provided by FluxSense and also allow for comparison between different ORS methods, two additional measurement studies will be conducted concurrently at one selected refinery by NPL and Atmosfir. NPL will

operate their state-of-the-art Differential Absorption Lidar (DIAL) facility downwind of the selected refinery for two consecutive weeks. In its typical configuration, a DIAL laser beam is scanned in a vertical plane to identify individual emission plumes from the refinery and to map the distribution of the target gases. By combining this information with wind data this technique provides a direct measure of the emission rate of the target gases and their spatial distribution. Although DIAL does not allow for mobile measurements around a refinery perimeter and does not fully satisfy the long-term measurement requirements of this particular project, it can be operated during the day and at night (SOF methods can only be used in the presence of sunlight). Also, the ability of DIAL to rapidly change the direction in which the measurements are made enables emission plumes to be tracked from their source to different downwind distances. Given its proven capabilities and the detailed emission data it provides, DIAL is ideal for field validation purposes.

At the same time, Atmosfir will conduct a five-week study to measure refinery-wide emissions of methane, VOCs, NO_x, and SO_2 using a well-established strategy based on U.S. EPA Other Test Method 10 (OTM-10), "*Optical Remote Sensing for Emission Characterization from Non-Point Sources.*" This method includes the use of two monostatic, open-path FTIR instruments (i.e., one upwind and one downwind of a selected refinery) and of multiple retro-reflector mirrors mounted at ground level and on a vertical structure. The system will be designed and operated to maximize plume capture from the refinery and minimize interferences from external sources. Also in this case, continuous gas pollutant concentrations will be combined with wind information to estimate facility-wide emission rates for the refinery of interest. Although this method does not allow for mobile measurements around a refinery perimeter and the detection limit for BTEX compounds is typically higher than that obtained using SOF or DIAL, this technique has been thoroughly validated by the U.S. EPA and can be used to detect gaseous emissions during the day and at night.

<u>Project 2: Quantification of Gaseous Emissions from Gas Stations, Oil Wells and Other Small Point Sources</u>

A five-week study will be carried out by FluxSense to characterize and quantify fugitive VOC emissions from gas stations, oil wells and other small point sources using a combination of SOF, DOAS, and FTIR techniques. Measurements of methane and non-methane VOCs will be taken from a mobile vehicle at 50 to 100 oil wells, 20 to 40 gas stations, and at several other point sources (e.g. tank depots, fuel loading from barges and railyards), all located in the South Coast Basin. ORS measurements will be complemented by wind data from ground-based sensors and from a wind LIDAR. The optical techniques will be validated by a controlled release exercise in the vicinity of one or more of the sources. The SCAQMD will help identify suitable measurement sites located in areas with good access to wind and other meteorological data.

To validate the fugitive emission results provided by FluxSense and also allow for comparison between different ORS methods, two concurrent measurement studies will

be conducted at selected oil wells, gas stations, tank depots and barges by NPL and Kassay. Specifically, NPL will operate their DIAL facility to characterize and quantify methane and non-methane VOC emissions from seven of the same individual point sources selected by FluxSense. The DIAL technique is well suited to map the full distribution of emissions from these types of sources including emissions at high and low elevations and to identify potential local background contributions. As mentioned earlier, DIAL is ideal for field validation purposes and a side-by-side comparison between this technique and FluxSense's SOF method would provide invaluable quality assurance information and direct validation of the SOF results.

Validation measurements will also be carried out by Kassay for five consecutive weeks using an open-path FTIR instrument mounted on a trailer to independently measure fugitive VOC emissions from 50 of the same individual point sources selected by FluxSense. The FTIR, along with a portable meteorological tower, will be transported to each source location and positioned in an orientation to best capture the plume. A retro-reflector will be deployed at a distance to reflect the infrared beam while intercepting prevailing winds that transport VOCs from the source towards critical receptors. FTIR, meteorological and location data will be processed to calculate and present a "snap-shot" emission rate for the sample period. Upwind, off-wind and synthetic backgrounds, a dispersion modeling software, and ground-based meteorological data will be used to correctly identify and subtract potential background contributions. As for Project 1, the proposed open-path FTIR method does not allow for mobile measurements around the targeted point sources, and the detection limit for some of the targeted compounds may be higher than that obtained using SOF of DIAL. However, the method proposed by Kassay has been successfully used in the past for similar applications and adheres to the guidelines that are recommended by U.S. EPA's "*Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*" (TO-16).

<u>Project 3: Quantification of Stack Emissions from Marine Vessels</u>
FluxSense will conduct a four-week study to measure "real world" emissions (g/s) of SO_2 and NO_2 and emission factors (g/Kg fuel burnt) of SO_2, NO_x and particulates from individual ships moving in and out of either the Los Angeles or Long Beach Ports. Land and mobile (i.e. on-vessel) measurements will be carried out using a combination of optical methods and a real-time "sniffer" system based on more traditional air monitoring techniques. In addition, total "bubble" emissions of NO_2 and possibly SO_2 will be conducted from the Los Angeles or Long Beach harbors. The equipment will be initially placed "on-shore" (e.g., deployed on a van or set-up inside a container) for about two weeks and then on a marine vessel for about two weeks. Such measurements will then be used to estimate "actual" emission factors for individual ships and total emissions in various modes of ship operation. The optical technique will be validated by a controlled release exercise in the vicinity of one or more of the sources. The SCAQMD will work with the ports and other local authorities to facilitate all land- and

vessel-based activities. None of the other proposals submitted as part of RFP #P2014-07 has been selected to validate the measurement approach proposed by FluxSense.

Based on feedback received by the evaluation panel, staff concluded that further discussion and evaluation is needed before selecting one or more contractors to develop a remote sensing "Optical Tent" that would provide early warning and real-time alerts to schools and communities downwind of a refinery (Project 4), and a portable I-DOAS system to make survey scans of smoke stacks, flares and other similar sources (Project 5). Staff intends to come back with a recommendation on these two projects at a later date. Table 1 shows a list of all contractors that have been proposed to accomplish the goals and objectives of Projects 1 through 3, the scope of their measurements (i.e., Main vs. Validation), and the cost of each proposal.

Benefits to SCAQMD

This proposed work will provide SCAQMD and its stakeholders with advanced capabilities for continuous monitoring of a number of trace gas pollutants in the air in and around the refinery complex, with low detection limits and high temporal resolution. The successful deployment and implementation of these ORS techniques will establish SCAQMD as the first air monitoring agency in the country with such capabilities. Enhanced monitoring capabilities will greatly contribute to improving emission inventory estimates by narrowing the gap between measured and reported fugitive emission levels from refineries. The results of these studies will also serve as valuable input to improving future air quality model performance and refining future attainments/control strategies and environmental decision-making. In addition, measured data on VOC emissions will allow SCAQMD to refine its air quality forecasting capabilities by better predicting ozone and particle formation in the South Coast Basin.

Resource Impacts

The Rule 1118 Mitigation Fund (54) will be used to fund the contract awards listed in Table 1. Sufficient funding exists in the Rule 1118 Mitigation Fund (54).

Attachments

Table 1 - Proposed Contractors & Objectives
Table 2 - Summary of Proposal Scores

Table 1 – Proposed Contractors & Objectives

List of all contractors proposed to accomplish the goals and objectives of Projects 1 through 3, scope of their proposed measurements (i.e., Main vs. Validation/Comparative), and the cost of each proposal.

	Main Measurements		**Validation/Comparative Measurements**						
	Company	**Cost**	**Company**	**Cost**	**Company**	**Cost**	**Company**	**Cost**	**Total Cost**
PROJECT 1: Quantification of Fugitive Emissions from Large Refineries	FluxSense	$173,081	NPL	$243,665	Atmosfir	$145,000			**$561,746**
PROJECT 2: Quantification of Gaseous Emissions from Gas Stations, Oil Wells and Other Small Point Sources	FluxSense	$179,543	NPL	$45,097			Kassay	$155,182	**$379,822**
PROJECT 3: Quantification of Stack Emissions from Marine Vessels	FluxSense	$159,237							**$159,237**
PROJECT 4: Development of a Remote Sensing "Optical Tent" for Continuous Near-Real Time Emissions	*No contractor selected for Projects 4 and 5 yet (Proposals under further evaluation)*								
PROJECT 5: Development of a Portable Imaging-DOAS System to Survey Emissions from Individual Smoke Stacks and Flares									
		$511,861		**$288,762**		**$145,000**		**$155,182**	**$1,100,805**

Table 2 – Summary of Proposal Scores

Total scores summarizing the cumulative points awarded to all proposals received to address the goals and objectives of Projects 1 through 3.

PROJECT 1: Quantification of Fugitive Emissions from Large Refineries		**PROJECT 2**: Quantification of Gaseous Emissions from Gas Stations, Oil Wells and Other Small Point Sources		**PROJECT 3**: Quantification of Stack Emissions from Marine Vessels	
Company	**Total Score (56-100)**	**Company**	**Total Score (56-100)**	**Company**	**Total Score (56-100)**
FluxSense	**94.5**	FluxSense	**94.3**	FluxSense	**93.7**
Atmosfir	**71.9**	Kassay	**93.2**	NPL	**91.5**
NPL	**64.3**	NPL	**72.2**	Rebellion Photonics*	***Below minimal technical score (<56 & no cost provided***
Rebellion Photonics*	***No cost provided***	Atmosfir	**68.9**		
		Rebellion Photonics*	***No cost provided***		

*Although Rebellion Photonics did not submit any cost information and was disqualified from the evaluation process, their proposed technology will be further evaluated by SCAQMD staff for future potential fence-line applications

Clean Transportation
Funding from the MSRC
Mobile Source Air Pollution Reduction Review Committee

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 6

PROPOSAL: Approve Contract Awards and Modifications Approved by MSRC

SYNOPSIS: As part of their FYs 2012-14 AB 2766 Discretionary Fund Work Program, the MSRC approved three new contracts as well as correction of an award under the Alternative Fuel Infrastructure Program, and a contract value increase under the Alternative Fuel School Bus Incentives Program. As part of their FYs 2014-16 Work Program, the MSRC approved exercising the contract option with Mineral Studios for continuation of website services for two more years. At this time the MSRC seeks Board approval of the contract awards and modifications.

COMMITTEE: Mobile Source Air Pollution Reduction Review, January 15, 2015, Recommended for Approval

RECOMMENDED ACTIONS:

1. Approve a funding augmentation to existing contract #MS14009 with A-Z Bus Sales in an amount not to exceed $45,000 under the Alternative Fuel School Bus Incentives Program as part of approval of the FYs 2012-14 AB 2766 Discretionary Fund Work Program, as described in this letter;
2. Approve corrected award under the Alternative Fuel Infrastructure Program, changing the awardee name to Grand Central Recycling instead of Pomona Valley Transfer Station and for installation of a new station instead of expansion of an existing station, as listed in Agenda Item #16 on the December 5, 2014 SCAQMD Board agenda (Recommended Action 3.h.), as part of approval of the FYs 2012-14 AB 2766 Discretionary Fund Work Program, as described in this letter;
3. Approve the award of three contracts totaling $449,000 under the Alternative Fuel Infrastructure Program, as part of approval of the FYs 2012-14 AB 2766 Discretionary Fund Work Program, as described in this letter and as follows:
   a. A contract with City of Monterey Park in an amount not to exceed $225,000 for expansion of their existing CNG fueling station including public access;
   b. A contract with Serv-Wel Disposal Services in an amount not to exceed $100,000 for installation of a new limited access CNG fueling station; and
   c. A contract with West Covina Unified School District in an amount not to exceed $124,000 for expansion of their existing limited access CNG fueling station;

4. Exercise second two-year option with Mineral Studios for website services in the amount of $17,200 as part of approval of the FYs 2014-16 AB 2766 Discretionary Fund Work Program, as described in this letter;
5. Authorize MSRC the authority to adjust contract awards up to five percent, as necessary and previously granted in prior work programs; and
6. Authorize the Chairman of the Board to execute new and modified contracts under FYs 2012-14 and 2014-16 Work Programs, as described above and in this letter.

Larry McCallon,
Vice Chair, MSRC

MM:HH:CR

Background

In September 1990 Assembly Bill 2766 was signed into law (Health & Safety Code Sections 44220-44247) authorizing the imposition of an annual $4 motor vehicle registration fee to fund the implementation of programs exclusively to reduce air pollution from motor vehicles. AB 2766 provides that 30 percent of the annual $4 vehicle registration fee subvened to the SCAQMD be placed into an account to be allocated pursuant to a work program developed and adopted by the MSRC and approved by the Board.

The MSRC completed selecting categories and targeted funding amounts for the FYs 2012-14 Work Program in May 2013. At its January 15, 2015 meeting, the MSRC considered recommended awards under the Alternative Fuel Infrastructure Program, as well as a recommended award correction and contract modifications. The MSRC also considered recommendations relative to continuing website hosting and maintenance. Details are provided below in the Proposals section.

Outreach

In accordance with SCAQMD's Procurement Policy and Procedure, public notices advertising the Alternative Fuel Infrastructure Program Announcement were published in the Los Angeles Times, the Orange County Register, the San Bernardino Sun, and Riverside County Press Enterprise newspapers to leverage the most cost-effective method of outreach to the South Coast Basin. In addition, the solicitation was advertised in the Desert Sun newspaper for expanded outreach in the Coachella Valley.

Additionally, potential bidders may have been notified utilizing SCAQMD's own electronic listing of certified minority vendors. Notice of the solicitation was e-mailed to the Black and Latino Legislative Caucuses and various minority chambers of commerce and business associations, and placed on the Internet at SCAQMD's Website (http://www.aqmd.gov). Further, the solicitation was posted on the MSRC's website at

http://www.cleantransportationfunding.org and electronic notifications were sent to those subscribing to this website's notification service.

Proposals

At its January 15, 2015 meeting, the MSRC considered recommendations from its MSRC-TAC and approved the following:

FYs 2012-14 Alternative Fuel School Bus Incentives Program

As part of the FYs 2012-14 Work Program, the MSRC allocated $2.0 million for the implementation of an Alternative Fuel School Bus Incentives Program. The MSRC previously deemed A-Z Bus Sales qualified for Program participation and authorized them to offer buy-down incentives to qualifying school districts or private providers of pupil transportation. The MSRC approved an initial award to A-Z Bus Sales in December 2013, and in subsequent actions the MSRC approved contract value increases to incentivize additional buses ordered. In January, the MSRC approved a new request from A-Z Bus Sales for an additional $45,000 to incentivize five Type C propane school buses ordered by Anaheim Union High School District, as part of the FYs 2012-14 AB 2766 Discretionary Fund Work Program.

FYs 2012-14 Alternative Fuel Infrastructure Program

As part of the FYs 2012-14 Work Program, the MSRC allocated $7.5 million for the implementation of new and expanded CNG and LNG refueling stations and modification of maintenance facilities to accommodate gaseous-fueled vehicles. A Program Announcement, #PA2014-05, was developed and released on September 6, 2013, with an open application period commencing October 8, 2013 and closing September 26, 2014. The MSRC previously considered 27 applications and awarded a total of $$3,952,954 for those projects; one award for $175,000 was subsequently declined. Among the previously approved awards, Pomona Valley Transfer Station was awarded $150,000 to expand their existing public access CNG station. Subsequent to the approval, staff discovered that this project had been inaccurately described to both the MSRC and SCAQMD. The award amount was correct, but the recipient should have been listed as Grand Central Recycling and the project should have been described as the installation of a new public access CNG station. The MSRC approved the corrected award. The MSRC also considered three applications whose review had been extended, and approved three contract awards totaling $449,000 as part of the FYs 2012-14 AB 2766 Discretionary Fund Work Program, as follows:

a. A contract with City of Monterey Park in an amount not to exceed $225,000 for expansion of their existing CNG fueling station including public access;
b. A contract with Serv-Wel Disposal Services in an amount not to exceed $100,000 for installation of a new limited access CNG fueling station; and
c. A contract with West Covina Unified School District in an amount not to exceed $124,000 for expansion of their existing limited access CNG fueling station.

Exercise Second Two-Year Option for Website Services

Several years ago the MSRC created a website as a marketing and outreach tool as well as a source of information for its contractors and other interested entities. Following an open RFP process, the MSRC selected Mineral Studios to redesign, host and maintain the MSRC website. The contract effectuating the award, #MS11001, allows for up to two extensions of two years each, contingent upon allocation of funds by the MSRC and approval by the SCAQMD Governing Board. The cost proposal for the option periods was included in the original proposal, at a rate of $8,600 per year. Basic hosting and maintenance would cost $300 per month, with the remainder available for website revisions/upgrades if required and directed by the MSRC. The MSRC approved exercising the first option in February 2013. At their January 2015 meeting, the MSRC unanimously approved executing the second two-year option to extend Mineral's contract and augmented the contract with $17,200 as part of the FYs 2014-16 Work Program.

At this time, the MSRC requests the SCAQMD Board to approve the contract awards and modifications as part of approval of the FYs 2012-14 and 2014-16 AB 2766 Discretionary Fund Work Programs as outlined above. The MSRC also requests the Board to authorize the SCAQMD Chairman of the Board the authority to execute all agreements described in this letter. The MSRC further requests authority to adjust the funds allocated to each project specified in this Board letter by up to five percent of the project's recommended funding. The Board has granted this authority to the MSRC for all past Work Programs.

Resource Impacts

The SCAQMD acts as fiscal administrator for the AB 2766 Discretionary Fund Program (Health & Safety Code Section 44243). Money received for this program is recorded in a special revenue fund (Fund 23) and the contracts specified herein, as well as any contracts awarded in response to the solicitation, will be drawn from this fund.

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 7

PROPOSAL: Legislative and Public Affairs Report

SYNOPSIS: This report highlights the December 2014 outreach activities of Legislative and Public Affairs, which include: an Environmental Justice Update, Community Events/Public Meetings, Business Assistance, and Outreach to Business and Federal, State, and Local Government.

COMMITTEE: No Committee Review

RECOMMENDED ACTION:
Receive and file.

Barry R. Wallerstein, D.Env.
Executive Officer

LBS:DJA:MC:DM:jf

BACKGROUND

This report summarizes the activities of Legislative and Public Affairs for December 2014. The report includes four major areas: Environmental Justice Update; Community Events/Public Meetings (including the Speakers Bureau/Visitor Services, Communications Center, and Public Information Center); Business Assistance; and Outreach to Business and Federal, State and Local Governments.

ENVIRONMENTAL JUSTICE UPDATE

The following are key environmental justice-related activities in which staff participated during the month of December. These events involve communities that may suffer disproportionately from adverse air quality impacts.

December 12

- Staff participated in the Healthy San Bernardino meeting. Staff provided an update on the Clean Communities Plan Commercial Electric Lawn Mower program and the VIP program to replace wood burning residential fireplaces.

December 17

- Staff participated in the Riverside County Health Coalition meeting to discuss public health education and outreach and provided information on the Environmental Justice for All Conference.

December 18

- Staff participated in Go Green, Save Green Small Business Workshop where they distributed information on SCAQMD small business programs, promoted the Martin Luther King, Jr. A Day of Public Service Forum event and shared other informational materials.

SPEAKERS BUREAU/VISITOR SERVICES

SCAQMD regularly receives requests for staff to speak on air quality-related issues from a wide variety of organizations, such as trade associations, chambers of commerce, community-based groups, schools, hospitals and health-based organizations. SCAQMD also hosts visitors from around the world who meet with staff on a wide range of air quality issues.

December 5

- 40 students from Cal Poly Pomona visited SCAQMD headquarters where they received an overview on the agency and air quality, participated in a discussion on alternative fueled vehicles, and toured the laboratory.

December 12

- 15 mayors from cities in China visited SCAQMD headquarters where they received an overview on the agency and air quality, participated in a discussion on air monitoring, and toured the laboratory.

December 16

- 20 representatives from the Shanghai Municipal Audit Bureau via Forte Exchange in China visited SCAQMD headquarters where they received an overview on the agency and air quality and monitoring, and a review of program performance and compliance through auditing.

December 17

- 22 representatives from the Beijing Municipal Bureau of Finance via Forte Exchange in China visited SCAQMD headquarters where they received an overview on the agency and air quality, participated in a discussion on air monitoring, and toured the laboratory.

COMMUNICATION CENTER STATISTICS

The Communication Center handles calls on the SCAQMD main line, 1-800-CUT-SMOG® line and Spanish line. Calls received in the month of November 2014 are summarized below:

Main Line Calls	2,671
1-800-CUT-SMOG® Line	1,865
After Hours Calls*	475
Spanish Line Calls	52
Total Calls	5,063

* Saturdays, Sundays, holidays, and after 7:00 p.m. Monday through Friday.

PUBLIC INFORMATION CENTER STATISTICS

The Public Information Center (PIC) handles phone calls and walk-in requests for general information. Information for the month of December 2014 is summarized below:

Calls Received by PIC Staff	115
Calls to Automated System	888
Total Calls	1,003
Visitor Transactions	207
E-Mail Advisories Sent	0

BUSINESS ASSISTANCE

SCAQMD notifies local businesses of proposed regulations so they can participate in the agency's rule development process. SCAQMD also works with other agencies and governments to identify efficient, cost-effective ways to reduce air pollution and shares that information broadly. Staff provides personalized assistance to small businesses both over the telephone and via on-site consultation. The information is summarized below:

Conducted 9 free on-site consultations
Provided permit application assistance to 78 companies
Issued 29 clearance letters

Types of business assisted:

Auto Body Shops	Auto Repair Shops	Metal Plating Facilities
Dry Cleaners	Machine Shops	Furniture Manufacturers
Gas Stations	Printing Facilities	Construction & Architecture
Restaurants/Bakeries		

OUTREACH TO COMMUNITY GROUPS AND FEDERAL, STATE, AND LOCAL GOVERNMENTS

Field visits and/or communications were conducted with elected officials or staff from the following cities:

Arcadia
Aliso Viejo
Anaheim
Beaumont
Brea
Buena Park
Diamond Bar
Fountain Valley
Hemet
La Habra
Lake Forest
Los Angeles
Mission Viejo
Norco
Newport Beach
Ontario
Pasadena
Redlands
Riverside
San Jacinto
Tustin
Yorba Linda

Visits and/or communications were conducted with elected officials or staff from the following State and Federal Offices:

- U.S. Senator Barbara Boxer
- U.S. Congressman Mark Takano
- State Senator Bob Huff
- State Senator Richard Roth
- Assembly Member Travis Allen
- Assembly Member Eric Linder
- Assembly Member Jose Medina
- Assembly Member Melissa Melendez
- Assembly Member Reggie Jones-Sawyer

Staff represented SCAQMD and/or provided a presentation to the following governments and business organizations:

Arcadia Chamber of Commerce
Association of Cities, Orange County
Irwindale Chamber of Commerce
Moreno Valley Chamber of Commerce
Orange County
Orange County Business Council
Orange County Transportation Authority
Redlands Chamber of Commerce
Riverside Transit Agency
Riverside County
Riverside County School District
Santa Monica Chamber of Commerce
San Bernardino Associated Governments
Southern California Gas Company

Southern California Association of Governments
Small Business Association, Ontario
United Nations Associations, Pasadena Chapter
Western Riverside County Council of Governments
Western Riverside County Transportation NOW (RTA)
-Greater Riverside Chapter, Riverside
-San Gorgonio Pass Chapter, Beaumont

Staff represented SCAQMD and/or provided a presentation to the following community groups and organizations:

American Heart Association
Culver City Senior Center
Orange County Department of Water and Power
Ontario Healthy Communities Coalition
Pasadena Water and Power Department
Riverside County Health Department
San Jacinto Health Center
Santa Monica Senior Center
San Bernardino County Health Department
Urban Conservation Corp, San Bernardino
Western Riverside County Water District

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 8

REPORT: Hearing Board Report

SYNOPSIS: This reports the actions taken by the Hearing Board during the period of December 1 through December 31, 2014.

COMMITTEE: No Committee Review

RECOMMENDED ACTION:
Receive and file this report.

Edward Camarena
Chairman of Hearing Board

SM

Two summaries are attached: **Rules From Which Variances and Orders for Abatement Were Requested in 2014** and **December 2014 Hearing Board Cases**.

The total number of appeals filed during the period December 1 to December 31, 2014 is 0; and total number of appeals filed during the period of January 1 to December 31, 2014 is 5.

Rules from which Variances and Order for Abatements were Requested in 2014														
	2014	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total Actions*
# of HB Actions Involving Rules														
109														0
109(c)														0
109(c)(1)														0
201														0
201.1														0
202														0
202(a)				1			2	1	1	1	1		1	8
202(b)		1												1
202(c)														0
203					1			1						2
203(a)		1		1	2	2	1		1	1	2			11
203(b)		7	4	7	4	2	9	5	1	3	6	2	8	58
204														0
208														0
218														0
218.1														0
218.1(b)(4)(C)														0
218(b)(2)			1											1
218(c)(1)(A)														0
218(d)(1)(A)														0
218(d)(1)(B)														0
219														0
219(s)(2)		1				1	1		1					4
221(b)														0
221(c)														0
221(d)														0
222											1			1
222(d)(1)(C)														0
222(e)(1)														0
401														0
401(b)														0
401(b)(1)							1	1						2
401(b)(1)(A)														0
401(b)(1)(B)										1				1
402		1				2	1		1					5
403(d)(1)														0
403(d)(1)(A)														0
403(d)(2)														0
404														0
404(a)														0
405														0
405(a)														0
405(b)														0
405(c)														0
407(a)								1						1
407(a)(1)			1									1		2

Rules from which Variances and Order for Abatements were Requested in 2014														
	2014	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total Actions*
407(a)(2)(A)														0
410(d)														0
430(b)(3)(A)(iv)														0
431.1														0
431.1														0
431.1(c)(1)														0
431.1(c)(2)														0
431.1(c)(3)(C)														0
431.1(d)(1)														0
431.1(d)(1), Att A(1)														0
442											1			1
444														0
444(a)														0
444(c)														0
444(d)														0
461														0
461(c)(1)														0
461(c)(1)(A)														0
461(c)(1)(B)														0
461(c)(1)(C)														0
461(c)(1)(E)														0
461(c)(1)(F)(i)														0
461(c)(1)(F)(iv)														0
461(c)(1)(F)(v)														0
461(c)(1)(H)														0
461(c)(2)														0
461(c)(2)(A)														0
461(c)(2)(B)														0
461(c)(2)(C)														0
461(c)(3)														0
461(c)(3)(A)														0
461(c)(3)(B)														0
461(c)(3)(C)														0
461(c)(3)(D)(ii)														0
461(c)(3)(E)														0
461(c)(3)(H)														0
461(c)(3)(M)														0
461(c)(4)(B)														0
461(c)(4)(B)(ii)														0
461(d)(5)(A)														0
461(e)(1)														0
461(e)(2)				2	1									3
461(e)(2)(A)														0
461(e)(2)(A)(i)														0
461(e)(2)(B)(i)														0
461(e)(2)(C)														0
461(e)(3)														0

Rules from which Variances and Order for Abatements were Requested in 2014														
	2014	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***Jun***	***Jul***	***Aug***	***Sep***	***Oct***	***Nov***	***Dec***	***Total Actions***
461(e)(3)(A)														0
461(e)(3)(C)(i)(I)														0
461(e)(3)(D)														0
461(e)(3)(E)														0
461(e)(5)				4	2									6
461(e)(7)														0
462		1	1											2
462(c)(4)(B)(i)														0
462(c)(7)(A)(ii)														0
462(d)														0
462(d)(1)						1					1			2
462(d)(1)(A)														0
462(d)(1)(A)(i)														0
462(d)(1)(B)		1												1
462(d)(1)(C)														0
462(d)(1)(E)(ii)														0
462(d)(1)(F)														0
462(d)(1)(G)														0
462(d)(5)				1										1
462(e)(1)														0
462(e)(1)(E)														0
462(e)(1)(E)(ii)														0
462(e)(1)(E)(i)(II)														0
462(e)(2)(A)(i)														0
462(e)(4)														0
462(h)(1)														0
463														0
463(c)														0
463(c)(1)														0
463(c)(1)(A)(I)-(iv)														0
463(c)(1)(B)														0
463(c)(1)(C)														0
463(c)(1)(D)														0
463(c)(1)(E)														0
463(c)(2)														0
463(c)(2)(B)														0
463(c)(2)(C)														0
463(c)(3)														0
463(c)(3)(A)														0
463(c)(3)(B)														0
463(c)(3)(C)														0
463(d)														0
463(d)(2)														0
463(e)(3)(C)														0
463(e)(4)														0
463(e)(5)(C)														0
464(b)(1)(A)														0

Rules from which Variances and Order for Abatements were Requested in 2014														
	2014	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total Actions*
464(b)(2)														0
468														0
468(a)														0
468(b)														0
1102														0
1102(c)(2)														0
1102(c)(5)														0
1102(f)(1)					1									1
1105.1								1						1
1105.1(d)(1)(A)(i)														0
1105.1(d)(1)(A)(iii)														0
1106(c)(1)														0
1106.1(c)(1)														0
1106.1(c)(1)(A)														0
1107(c)(1)														0
1107(c)(2)														0
1107(c)(7)														0
1107														0
1110.1														0
1110.2					1									1
1110.2(c)(14)														0
1110.2(d)														0
1110.2(d)(1)(A)														0
1110.2(d)(1)(B)							2	1						3
1110.2(d)(1)(B)(ii) (Table II)								1			1			2
1110.2(d)(1)(D)														0
1110.2(d)(1)(E)														0
1110.2(e)(1)(A)														0
1110.2(e)(1)(B)(i)(II)														0
1110.2(e)(1)(B)(i)(III)														0
1110.2(e)(4)(B)														0
1110.2(f)														0
1110.2(f)(1)(A)														0
1110.2(f)(1)(c)														0
1113(c)(2)														0
1113(d)(3)														0
1118(c)(4)														0
1118(c)(5)														0
1118(d)(1)(2)														0
1118(d)(1)(2)														0
1118(d)(2)														0
1118(d)(3)														0
1118(d)(4)(B)														0
1118(d)(5)(A)														0
1118(d)(5)(B)														0
1118(d)(10)														0
1118(d)(12)														0

Rules from which Variances and Order for Abatements were Requested in 2014														
	2014	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total Actions*
1118(e)														0
1118(g)(1)														0
1118(g)(3)														0
1118(g)(5)														0
1118(g)(5)(A)														0
1118(i)(5)(B)(i)														0
1118(i)(5)(B)(ii)														0
1118(j)(1)(A)(ii)														0
1118(j)(1)(B)(ii)														0
1118(j)(1)(C)														0
1121(c)(2)(C)														0
1121(c)(3)														0
1121(c)(6)														0
1121(c)(7)														0
1121(c)(8)														0
1121(e)(3)														0
1121(h)														0
1121(h)(1)														0
1121(h)(2)														0
1121(h)(3)														0
1122(c)(2)(A)														0
1122(c)(2)(E)														0
1122(d)(1)(A)														0
1122(d)(1)(B)														0
1122(d)(3)														0
1122(e)(2)(A)														0
1122(e)(2)(B)														0
1122(e)(2)(C)														0
1122(e)(2)(D)														0
1122(e)(3)														0
1122(e)(4)(A)														0
1122(e)(4)(B)														0
1122(g)(3)														0
1122(j)														0
1124														0
1124(c)(1)(A)														0
1124(c)(1)(E)														0
1124(c)(4)(A)										1				1
1125(c)(1)														0
1125(c)(1)(C)														0
1125(d)(1)														0
1128(c)(1)														0
1128(c)(2)														0
1130														0
1130(c)(1)														0
1130(c)(4)														0
1131														0

Rules from which Variances and Order for Abatements were Requested in 2014														
	2014	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total Actions*
1131(d)														0
1132(d)(2)														0
1132(d)(3)														0
1133(d)(8)														0
1133.2(d)(8)														0
1134(c)														0
1134(c)(1)														0
1134(d)														0
1134(d)(1)														0
1134(d)(2)(B)(ii)														0
1134(f)														0
1134(g)(2)														0
1135(c)(3)														0
1135(c)(3)(B)														0
1135(c)(3)(C)														0
1135(c)(4)														0
1135(c)(4)(D)														0
1136														0
1136(c)(1)(A)(i)														0
1137(d)(2)														0
1145														0
1145(c)(1)														0
1145(c)(2)														0
1145(g)(2)														0
1145(h)(1)(E)														0
1146							1							1
1146(c)(1(G)													1	1
1146(c)(1)(H)													1	1
1146(c)(2)		1		1										2
1146(c)(2)(A)						1								1
1146(d)(8)		1												1
1146.1														0
1146.1(a)(2)														0
1146.1(a)(8)														0
1146.1(b)(3)							1							1
1146.1(c)(1)													1	1
1146.1(c)(2)		1		1			1						1	4
1146.1(d)(4)							1							1
1146.1(d)(6)							1							1
1146.1(e)(1)													1	1
1146.1(e)(1)(B)														0
1146.1(e)(2)													1	1
1146.2														0
1146.2(c)(1)														0
1146.2(c)(2)(A)		1												1
1146.2(c)(5)					1				1					2
1146.2(e)														0

Rules from which Variances and Order for Abatements were Requested in 2014														
	2014	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total Actions*
1147				1										1
1147(c)(1)							2	1		2				5
1147(c)(10)							1			1			1	3
1147(c)(14)(B)		1												1
1150.1(d)(1)(C)(i)														0
1150.1(d)(4)														0
1150.1(d)(5)														0
1150.1(d)(10)								1						1
1150.1(d)(11)								1						1
1150.1(d)(12)								1						1
1150.1(d)(13)								1						1
1150.1(d)(14)								1						1
1150.1(e)(1)														0
1150.1(e)(2)														0
1150.1(e)(3)														0
1150.1(e)(1)(B)(C)														0
1150.1(e)(1)(C)														0
1151.1(e)(2)(B)(C)														0
1150.1(e)(2)(C)														0
1150.1(e)(3)(B)														0
1150.1(e)(3)(B)(C)														0
1150.1(e)(3)(C)														0
1150.1(e)(4)														0
1150.1(e)(6)(A)(I)														0
1150.1(e)(6)(A)(ii)														0
1150.1(f)(1)(A)(iii)(I)														0
1150.1(f)(1)(H)(i)														0
1151														0
1151(c)(8)														0
1151(2)														0
1151(5)														0
1151(d)(1)														0
1151(e)(1)														0
1151(e)(2)														0
1151(f)(1)														0
1153(c)(1)														0
1153(c)(1)(B)														0
1156(d)(5)(C)(i)														0
1158														0
1158(d)(2)														0
1158(d)(5)														0
1158(d)(7)														0
1158(d)(7)(A)(ii)														0
1158(d)(10)														0
1164(c)(1)(B)														0
1164(c)(2)														0
1166(c)(2)														0

Rules from which Variances and Order for Abatements were Requested in 2014														
	2014	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total Actions*
1166(c)(2)(F)														0
1168														0
1168(c)(1)														0
1169(c)(13)(ii)														0
1171														0
1171(c)														0
1171(c)(1)														0
1171(c)(1)(A)(i)														0
1171(c)(1)(b)(i)														0
1171(c)(4)														0
1171(c)(5)														0
1171(c)(5)(A)(i)														0
1171(c)(6)														0
1173		1	1											2
1173(c)														0
1173(d)														0
1173(e)(1)														0
1173(f)(1)(B)														0
1173(g)														0
1175														0
1175(c)(2)														0
1175(c)(4)(B)														0
1175(c)(4)(B)(i)														0
1175(c)(4)(B)(ii)														0
1175(c)(4)(B)(ii)(I)														0
1175(b)(1) (C)														0
1175(d)(4)(ii)(II)														0
1176														0
1176(e)														0
1176(e)(1)														0
1176(e)(2)														0
1176(e)(2)(A)														0
1176(e)(2)(A)(ii)														0
1176(e)(2)(B)(v)														0
1176(f)(3)														0
1177(d)(2)(D)														0
1178(d)(1)(A)(xiii)														0
1178(d)(1)(A)(xiv)														0
1178(d)(1)(B)														0
1178(d)(1)(C)														0
1178(d)(3)(C)														0
1178(d)(3)(D)														0
1178(d)(3)(E)														0
1178(d)(4)(A)(i)														0
1178(g)							1							1
1186.1														0
1186.1														0

Rules from which Variances and Order for Abatements were Requested in 2014														
	2014	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total Actions*
1189(c)(3)														0
1195														0
1195(d)(1)(D)														0
1303(a)								1						1
1303(a)(1)				1				1						2
1303(b)(1)								1						1
1401								1						1
1401(d)							1							1
1401(d)(1)(A)														0
1401(d)(1)(B)														0
1405(d)(3)(C)														0
1407(d)														0
1407(d)(1)														0
1407(d)(2)														0
1407(d)(5)								1						1
1407(f)(1)														0
1415(d)(3)														0
1418(d)(2)(A)														0
1420(d)(1)								1						1
1420.1(f)(3)					1									1
1420.1(g)(4)														0
1420.1(k)(13)(B)									1					1
1421(d)														0
1421(d)(1)(C)														0
1421(d)(1)(G)														0
1421(d)(3)(A)														0
1421(e)(2)(c)														0
1421(e)(1)(A)(vii)														0
1421(e)(3)(B)														0
1421(h)(1)(A)														0
1421(h)(1)(B)														0
1421(h)(1)(C)														0
1421(h)(1)(E)														0
1421(h)(3)														0
1421(i)(1)(C)														0
1425(d)(1)(A)														0
1469														0
1469(c)														0
1469(c)(8)														0
1469(c)(11)(A)														0
1469(c)(13)(ii)														0
1469(d)(5)														0
1469(e)(1)														0
1469(e)(7)						1								1
1469(g)(2)														0
1469(h)														0
1469(I)														0

Rules from which Variances and Order for Abatements were Requested in 2014														
	2014	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total Actions*
1469(j)(4)(A)														0
1469(j)(4)(D)														0
1469(k)(3)(A)														0
1470														0
1470(c)(2)(C)(i)(I)														0
1470(c)(2)(C)(iv)														0
1470(c)(3)(B)(ii)											1			1
1470(c)(3)(C)(iii)		2	1				3				2		1	9
1470(c)(4)								1						1
1470(c)(4)(B)					1									1
1470(c)(5)							1	1						2
1470(d)(2)(B)							3							3
1470(e)(2)(A)							3							3
2004(c)(1)														0
2004(c)(1)(C)														0
2004(f)(1)		2	3	2	1		4	3	2	2	3	2	8	32
2004(f)(2)														0
2004(k)														0
2005														0
2009(b)(2)														0
2009(c)														0
2009(f)(1)														0
2009(f)(2)														0
2009.1														0
2009.1(c)														0
2009.1(f)(1)														0
2009.1(f)(2)														0
2009.1(f)(3)														0
2011														0
2011 Attachment C														0
2011(c)(2)														0
2011(c)(2)(A)										1	1			2
2011(c)(2)(B)														0
2011(c)(3)(A)										1	1			2
2011(e)(1)										1	1			2
2011(f)(3)														0
2011(g)														0
2011(g)(1)														0
2011(k)										1	1			2
2011(k) Appen. A, Chap. 2, except E & Attach C														0
2011(k) Appen. A, Chap. 2, Section A.3 a-c, A.5 and B. 1-4														0
and Appen. A, Chap. 2, Section C.2.a, c & d														0
2011, Table 2011-1, Appen. A, Chap. 2, Attach. C										1	1			2
2012 Chapter 2								1						1
2012 Attach. C, B.2.a			1											1
2012 Appen. A, Attach. C, Section B.2.		1												1
2012 Appen. A, Attach. C, Section B.2.a. & b.														0

Rules from which Variances and Order for Abatements were Requested in 2014													
2014	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total Actions*
2012 Appen. A													0
2012 Appen. A, Chap. 2													0
2012 Appen A, Chap. 2, Sec. A		1											1
2012 Appen A. Chap. 2. Sec. A1(a)													0
2012 Appen A, Chap. 2, Sec. B													0
2012, Appen. A, Protocol 2012, Chap. 2, B.5.													0
2012, Appen A, Chap. 2, B.5.a													0
2012, Appen A, Chap. 2, B.10													0
2012, Appen A, Chap. 2, B.11													0
2012, Appen A, Chap. 2, B.12													0
2012, Appen A, Chap. 2, B.17													0
2012, Appen A, Chap.2, B.18													0
2012, Appen A, Chap.2, B.20													0
2012, Chapter 2, E.2.b.i.													0
2012, Chapter 2, E.2.b.ii.													0
2012 Appen A, Chap. 4.A.4													0
2012(B)(5)(e)							1						1
2012(c)(2)(A)									1	2		1	4
2012(c)(2)(B)													0
2012(c)(3)													0
2012(c)(3)(A)									1	1		1	3
2012(c)(3)(B)													0
2012(c)(10)													0
2012(d)(2)													0
2012(d)(2)(A)													0
2012(d)(2)(D)													0
2012(f)(2)(A)													0
2012(g)(1)									1	1		1	3
2012(g)(3)													0
2012(g)(7)													0
2012(h)(3)													0
2012(h)(4)													0
2012(h)(5)													0
2012(h)(6)													0
2012(i)													0
2012(j)(1)													0
2012(j)(2)													0
2012, Protocol (Appen. A) Chap. 2, Part A.1.a													0
2012, Protocol (Appen. A) Chap. 2, Part B.4													0
2012, Protocol, (Appen A) Chap. 2, Part B.5.e													0
2012 Chapter 2, B.5.f													0
2012(m)									1	1			2
2012(m) Table 2012-1, and Appen. A, Chp 2, & Attachment C									1	1		1	3
2012(m) Appen. A, Attach. C													0
2012(m) Appen. A, Chap. 2, Sections 2.A.1 a-c, e.g,													0
and B. 1-4 and Appendix A, Chapter 3, Section C.2 a, c & d													0
2012(m) Appen. A, Chap 3, Section (A)(6)													0

Rules from which Variances and Order for Abatements were Requested in 2014													
2014	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***Jun***	***Jul***	***Aug***	***Sep***	***Oct***	***Nov***	***Dec***	***Total Actions***
2012(m) Appen. A, Chap 5, Para G, Table 5B and Att. D													0
3002													0
3002(a)													0
3002(c)	1		1			1							3
3002(c)(1)	4	3	2	1		5	2	2	3	4	2	5	33
3002(c)(2)												1	1
Regulation II													0
Regulation IX													0
Regulation IX, 40 CFR Part 60, Subpart J													0
Regulation XI													0
Regulation XIII													0
H&S 39152(b)													0
H&S 41510													0
H&S 41700	1				2	1		1					5
H&S 41701						1	1		1				3
H&S 93115.6(c)(2)(C)(1)													0
H&S 42303													0
Title 13 Code of Regulations §2452													0

Report of December 2014 Hearing Board Cases

Case Name and Case No.	Rules	Reason for Petition	District Position/ Hearing Board Action	Type and Length of Variance or Order	Excess Emissions
1. Burbank Water and Power Case No. 1474-27 (Consent Calendar; No Appearance)	203(b) 2004(f)(1) 3002c)(1)	NH3 slip test cannot be done on two power generating boilers because they have been out of service since 2012.	Not Opposed/Granted	RV granted commencing 1/1/15 and continuing through 12/31/15, the FCD.	None
2. Burbank Water and Power Case No. 1474-28 (Consent Calendar; No Appearance)	203(b) 2004(f)(1) 3002(c)(1)	Emission limits may be exceeded during tuning of new control system for boiler.	Not Opposed/Granted	SV granted commencing upon notice to be given and continuing through 3/10/15.	NOx: 17.107 lbs/day CO: 12.1 lbs/day NH3: 6.3 lbs/day
3. ExxonMobil Oil Corporation Case No. 1183-488 (Consent Calendar; No Appearance)	203(b) 2004(f)(1) 2012(c)(2)(A) 2012(c)(3)(A) 2012(g)(1) 2012(m), Table 2012-1, App. A, Ch 2, Att. C 3002(c)(1)	Petitioner seeks to continue operation of crude unit while SCR is bypassed while its catalyst is replaced.	Not Opposed/Granted	SV and AOC granted and shall be for 336 consecutive hours during a 14-day window of time between 12/31/14 and 1/30/15.	NOx: 1,164 lbs/day
4. Los Angeles Department of Water and Power Case No. 1263-72 (K. Manwaring)	203(b) 2004(f)1) 3002(c)(1)	Petitioner cannot cease operation of power generating boiler per permit condition until new boiler commissioned. Commissioning delayed due to loss during typhoon of critical components while being shipped from manufacturer in Japan.	Not Opposed/Granted	RV granted commencing 90 days from the first fire of Unit GT6 and continuing through 180 days after first fire of Unit GT6 or 12/31/15, whichever comes first.	CO: 12,455.6 lbs/day NOx: 246.5 lbs/day SO2: 485 lbs/day VOC: 832 lbs/day PM10: 149.6 lbs/day
5. Park La Brea Case No. 6012-1 (K. Manwaring)	1146.1(c)(1) 1146.1(c)(2) 1146.1(e)(1) 1146.1(e)(2) 3002(c)(2)	Respondent operates 18 noncompliant boilers.	Not Opposed/Denied	RV denied.	N/A
6. SCAQMD vs. Air Liquide Large Industries, U.S., L.P. Case No. 5705-3 (T. Barrera)	203(b) 2004(f)(1) 3002(c)(1)	Respondent operating leaking deaerator.	Stipulated/Issued	O/A issued commencing 12/18/14 and continuing through 1/15/15.	N/A

Case Name and Case No.	Rules	Reason for Petition	District Position/ Hearing Board Action	Type and Length of Variance or Order	Excess Emissions
7. SCAQMD vs. County of Los Angeles Department of Health Services, Rancho Los Amigos National Rehabilitation Center Case No. 6013-1 (R. Fernandez)	1146(c)(1)(G) 1146(c)(1)(H)	Respondent operates four noncompliant boilers.	Stipulated/Issued	O/A issued commencing 12/3/14 and continuing through 10/31/15. The Hearing Board shall retain jurisdiction over this matter until 11/30/2015.	N/A
8. SCAQMD vs. Minson Corporation Case No. 6011-1 (N. Feldman)	1147(c)(10)	Respondent operates noncompliant natural-gas fired powder coating oven and heated parts washer.	Stipulated/Issued	O/A issued commencing 12/16/14 and continuing through 9/30/15. The Hearing Board shall retain jurisdiction over this matter until 9/30/15.	N/A
9. SCAQMD vs. SIC/LEED 1015 Santa Ana LLC Case No. 6009-1 (Consent Calendar; No Appearance)	1470(c)(3)(C)(iii)	Respondent operating noncompliant emergency diesel generator within 100 meters of a school.	Stipulated/Issued	O/A issued commencing 12/16/14 and continuing through 5/31/15. The Hearing Board shall retain jurisdiction over this matter until 5/31/15.	N/A
10. Signal Hill Petroleum, Inc. Case No. 2166-18 (K. Manwaring)	203(b) 2004(f)(1)	Erratic readings from NH3 CEMS.	Not Opposed/Granted	Ex Parte EV granted commencing 12/10/14 and continuing for 30 days or until the EV hearing currently scheduled for 12/17/14, whichever comes first.	NH3: TBD by 12/26/14
11. Signal Hill Petroleum, Inc Case No. 2166-18 (N. Feldman)	203(b) 2004(f)(1)	Erratic readings from NH3 CEMS.	Not Opposed/Granted	EV granted commencing 12/17/14 and continuing until the SV hearing currently scheduled for 1/8/15.	None
12. Ultramar, Inc., Valero Wilmington Refinery Case No. 3845-91 (N. Sanchez)	202a 203(b) 2004(f)(1)	Various refinery units will be shut down for maintenance and catalyst replacement.	Not Opposed/Granted	SV and AOC granted commencing 1/12/15 and continuing through 2/24/15.	None

Acronyms

AOC: Alternative Operating Conditions
CEMS: Continuous Emissions Monitoring System
CO: Carbon Monoxide
EV: Emergency Variance
FCD: Final Compliance Date
H2S: Hydrogen Sulfide
IV: Interim Variance
MFCD/EXT: Modification of a Final Compliance Date and Extension of a Variance
Mod. O/A: Modification of an Order for Abatement
NH3: Ammonia
NOx: Oxides of Nitrogen
N/A: Not Applicable
O/A: Order for Abatement
PM: Particulate Matter
RV: Regular Variance
SCR: Selective Catalytic Reduction
SOx: Oxides of Sulfur
SV: Short Variance
TBD: To be determined
VOC: Volatile Organic Compound

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 9

REPORT: Civil Filings and Civil Penalties Report

SYNOPSIS: This reports the monthly penalties from December 1 through December 31, 2014, and legal actions filed by the General Counsel's Office from December 1 through December 31, 2014. An Index of District Rules is attached with the penalty report.

COMMITTEE: Stationary Source, January 23, 2015, Reviewed

RECOMMENDED ACTION:
Receive and file this report.

Kurt R. Wiese
General Counsel

KRW:lc

No Civil Actions Filed

Attachments
December 2014 Penalty Report
Index of District Rules and Regulations

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
General Counsel's Office

December 2014 Settlement Penalty Report

Total Penalties

Civil Settlements:	**$5,345,300.00**
Self-Reported Settlements:	**$67,000.00**
MSPAP Settlements:	**$41,118.00**
Hearing Board Settlements:	**$11,000.00**
Total Cash Settlements:	**$5,464,418.00**
Total SEP Value:	**$299,000.00**
Fiscal Year through December 2014 Cash Total:	**$6,704,551.66**
Fiscal Year through December 2014 SEP Value Only Total:	**$299,000.00**

FAC ID	COMPANY NAME	RULE NUMBER	RECLAIM ID	SETTLED DATE	ATTY INT	NOTICE NO.	TOTAL SETTLEMENT

FAC ID	COMPANY NAME	RULE NUMBER	RECLAIM ID	SETTLED DATE	ATTY INT	NOTICE NO.	TOTAL SETTLEMENT
CIVIL SETTLEMENTS:							
161754	DEAN FOODS OF SOUTHERN CAL LLC	41700 402 402 41700 41700 402 41700 402		12/16/2014	KCM	P59406 P57683 P59406 P59404 P59403 P57683 P59404	$32,000.00
800189	DISNEYLAND RESORT	2012	Y	12/2/2014	NAS	P57814	$2,500.00
148978	GOLDEN WEST LUBRICANTS	1144		12/2/2014	WBW	P55897	$1,000.00
6384	LA CO., RANCHO LOS AMIGOS NAT. REHAB	1146		12/23/2014	RRF	P57289	$50,000.00
800183	PARAMOUNT PETR CORP	1176 2012 2004 2011 2004 2004	Y	12/2/2014	TRB	P53796 P53791 P53782 P53791 P53783 P53791	$24,500.00
169962	PECORA CORPORATION	1113(C)(1)		12/16/2014	WBW	P60323	$5,600.00
3585	R. R. DONNELLEY & SONS CO	3002(C)(1)	Y	12/19/2014	BTG	P56322	$1,500.00

FAC ID	COMPANY NAME	RULE NUMBER	RECLAIM ID	SETTLED DATE	ATTY INT	NOTICE NO.	TOTAL SETTLEMENT
7757	REPUBLIC WASTE SERVICES OF SO CALIFORNIA	203 (B) 402, H&S Code 41700		12/16/2014	WBW	P53990 P53989	$10,000.00
167981	TESORO LOGISTICS OPERATIONS LLC	462 462, 3002	Y	12/23/2014	KCM	P56566 P52623	$8,400.00
142002	THE VILLAS AT PARK LA BREA	203 (A)		12/11/2014	KCM	P57932	$8,800.00
6768	VERNON CITY, PUB WKS FAC	1470		12/4/2014	NSF	P62364	$25,000.00
176758	WESTMINSTER HOMEOWNERS ASSOCIATION I	1146.1 201, 203 (A)		12/18/2014	KCM	P61701	$1,000.00

TOTAL CIVIL SETTLEMENTS: $170,300.00

SUPPLEMENTAL ENVIRONMENTAL PROJECTS:

800335	LA CITY, DEPT OF AIRPORTS Cash: $75,000; SEP: $99,000 Department of Airports agrees to replace three gasoline powered passenger vehicles currently in use at LAX with	2004, 3002	Y	12/18/2014	NSF	P54976	$174,000.00

FAC ID	COMPANY NAME	RULE NUMBER	RECLAIM ID	SETTLED DATE	ATTY INT	NOTICE NO.	TOTAL SETTLEMENT
	three 100% electric passenger vehicles to be completed within six months from the date of the settlement agreement (June 2, 2015).						
18931	TAMCO Cash: $5,100,000; SEP: $200,000 SEP to be applied at the Rancho Cucamonga steel mill that will benefit air quality and include, but not limited to, the installation of equipment to reduce the emission of air contaminants beyond AQMD rule equipment; the purchase and use of electric or fuel cell vehicles; and/or installation of additional non-required air pollution monitoring equipment by December 31, 2015.	203, 3002 2012(C)(2)(A) 201, 2004 2012(I) 2012(C)(3)(A) 1420 2004 3002	Y	12/16/2014	NSF	P52187 P49165 P53133 P52187	$5,300,000.00

TOTAL SEP SETTLEMENTS: $5,474,000.00

SELF-REPORTED VIOLATIONS:

46646	ARLON, MATERIALS FOR ELECTRONICS DIV	3002 203 1147		12/10/2014	NAS	SRV103	$17,000.00
113518	BREA PARENT 2007,LLC	202, 203, 3002		12/16/2014	MJR	SRV104	$50,000.00

FAC ID	COMPANY NAME	RULE NUMBER	RECLAIM ID	SETTLED DATE	ATTY INT	NOTICE NO.	TOTAL SETTLEMENT
TOTAL SRV SETTLEMENTS:	**$67,000.00**						
MSPAP SETTLEMENTS:							
98727	ANAHEIM CITY	203 (A)		12/10/2014		P61856	$990.00
171285	C T PROPANE 2	461, H&S Code 41960.2		12/2/2014		P62243	$745.00
171285	C T PROPANE 2	461(C)(2)(B) 203 (B)		12/2/2014		P60222	$705.00
145547	COSTA MESAOIL CO	203 (B)		12/2/2014		P62407	$1,000.00
176986	ENTRAVISION	203 (A)		12/31/2014		P61427	$5,000.00
177292	G & G INDUSTRIAL	203 (A)		12/10/2014		P56718	$900.00
162543	GM CONCRETE PUMPING	203 (A)		12/10/2014		P59848	$200.00
97250	HARTFIELD CONST	1403		12/23/2014		P61065	$1,000.00
23401	HOOD MFG INC	3003		12/17/2014		P58273	$200.00
77421	ISLAND RENTALS INC	461 (E) (2)		12/23/2014		P60705	$300.00
168509	J. MCLOUGHLIN ENGINEERING CO., INC	403.1		12/23/2014		P56037	$4,800.00
176321	L. A. PROPERTIES	1403		12/23/2014		P61064	$850.00
5172	LA CITY, PARKS & REC DEPT	203 (B) 461 (E) (2)		12/10/2014		P59366	$500.00

FAC ID	COMPANY NAME	RULE NUMBER	RECLAIM ID	SETTLED DATE	ATTY INT	NOTICE NO.	TOTAL SETTLEMENT
34837	LA CO., FIRE DEPT CAMP #14	461		12/10/2014		P61310	$1,500.00
175537	LOS ANGELES COUNTY FIRE DEPARTMENT	201, 461 203(A)		12/10/2014		P61311	$2,000.00
154188	MAIN STREET VALERO	41960.2 461(C)(2)(B)		12/19/2014		P59345	$510.00
85542	MANOR HEALTH CARE CORP	1146.2		12/2/2014		P58895	$1,000.00
143584	NEW CINGULAR WIRELESS PCS, AT&T MOBI	203 (A)		12/2/2014		P61425	$800.00
171321	ONTARIO FUEL	203 (B)		12/10/2014		P60913	$500.00
171321	ONTARIO FUEL	203 (B)		12/10/2014		P60918	$500.00
62724	ROBLES AUTOBODY	203 (A)		12/10/2014		P59515	$1,000.00
144027	S & M SERVICE STATION, INC	461(C)(2)(B) H&S Code 41960.2		12/31/2014		P59314	$638.00
58670	SAN JUAN SERVICE	461(C)(2)(B)		12/2/2014		P61654	$750.00
156200	STAY GREEN, INC.	203(A)		12/16/2014		P44879	$1,800.00
147620	SUNRIDER MANUFACTURING	1146		12/3/2014		P50734	$2,900.00
173527	TARGET CORPORATION	201		12/30/2014		P61438	$800.00
151937	TESORO S. COAST CO	461(C)(2)(B)		12/30/2014		P61657	$750.00

FAC ID	COMPANY NAME	RULE NUMBER	RECLAIM ID	SETTLED DATE	ATTY INT	NOTICE NO.	TOTAL SETTLEMENT
168347	THE GEORGIAN HOTEL	1146.2		12/31/2014		P60124	$640.00
137708	TLM PETRO LABOR FORCE INC	461 H&S Code 41954		12/17/2014		P60906	$640.00
51097	UNITED OIL, RAPID GAS #5	203 (B)		12/19/2014		P59327	$6,400.00
800265	UNIV OF SO CAL (EIS & NSR USE ONLY)	3002(C)(1)		12/19/2014		P62477	$800.00

TOTAL MSPAP SETTLEMENTS: $41,118.00

HEARING BOARD SETTLEMENTS:

35188	3M COMPANY Hearing Board Case No. 5970-2 Penalty for ongoing operation of the facility's equipment in noncompliance until 9.15.15.	203, 1147, 1303		12/10/2014	KCM	HRB2254	$4,000.00
155560	LA SALLE HIGH SCHOOL Hearing Board Case No. 5990-2 Facility to pay $1500/month for every month the engine is operated.	1110.2, 1470		12/3/2014	TRB	HRB2251	$1,500.00
155560	LA SALLE HIGH SCHOOL Hearing Board Case No. 5990-2 Facility to pay $1500/month for every month the engine is operated.	1110.2, 1470		12/10/2014	TRB	HRB2252	$1,500.00

FAC ID	COMPANY NAME	RULE NUMBER	RECLAIM ID	SETTLED DATE	ATTY INT	NOTICE NO.	TOTAL SETTLEMENT
155560	LA SALLE HIGH SCHOOL Hearing Board Case No. 5990-2 Facility to pay $1500/month for every month the engine is operated.	1110.2, 1470		12/31/2014	TRB	HRB2258	$1,500.00
114910	PROVIDENCE HOLY CROSS MEDICAL CTR. Hearing Board Case No. 5701-3 Beginning 12.15.13, facility to pay $1000/month until they permanently cease use of all 3 Detroit Diesel ICEs in noncompliance with Rule 1479.	1470		12/17/2014	NAS	HRB2256	$1,000.00
159780	ROXBURY MEDICAL TOWER Hearing Board Case No. 5977-1 Facility agrees to pay $500 for each day it operates an ICE used to drive an emergency fire pump at its medical office under an Order for Abatement.	203		12/31/2014	KCM	HRB2257	$500.00
173952	THE REHABILITATION CENTER OF BEVERLY Hearing Board Case No. 5996-2 Beginning 11.17.14, RCBH shall pay $1,000/month until they permanently cease use of all three boilers in noncompliance with District Rule.	1146.2		12/10/2014	NAS	HRB2253	$1,000.00

TOTAL HEARING BOARD SETTLEMENTS: $11,000.00

DISTRICT RULES AND REGULATIONS INDEX
FOR DECEMBER 2014 PENALTY REPORTS

REGULATION II – PERMITS

List and Criteria Identifying Information Required of Applicants Seeking A Permit to Construct from the South Coast Air Quality Management - District *(Amended 4/10/98)*

Rule 201 Permit to Construct *(Amended 1/5/90)*
Rule 202 Temporary Permit to Operate *(Amended 5/7/76)*
Rule 203 Permit to Operate *(Amended 1/5/90)*

REGULATION IV - PROHIBITIONS

Rule 401 Visible Emissions *(Amended 9/11/98)*
Rule 402 Nuisance *(Adopted 5/7/76)*
Rule 403.1 Wind Entrainment of Fugitive Dust *(Amended 6/16/00)*
Rule 461 Gasoline Transfer and Dispensing *(Amended 6/15/01)*
Rule 462 Organic Liquid Loading *(Amended 5/14/99)*

REGULATION XI - SOURCE SPECIFIC STANDARDS

Rule 1110.2 Emissions from Gaseous- and Liquid-Fueled Internal Combustion Engines *(Amended 11/14/97)*
Rule 1113 Architectural Coatings *(Amended 6/20/01)*
Rule 1144 Metalworking Fluids And Direct-Contact Lubricants
Rule 1146 Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters *(Amended 11/17/00)*
Rule 1146.1 Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters *(Amended 5/13/94)*
Rule 1146.2 Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers *(Adopted 1/9/98)*
Rule 1147 NOx REDUCTIONS FROM MISCELLANEOUS SOURCES (9/08)
Rule 1176 Sumps and Wastewater Separators *(Amended 9/13/96)*

REGULATION XIII - NEW SOURCE REVIEW

Rule 1303 Requirements *(Amended 4/20/01)*

REGULATION XIV - TOXICS

Rule 1403	Asbestos Emissions from Demolition/Renovation Activities *(Amended 4/8/94)*
Rule 1420	Emissions Standard for Lead *(Adopted 9/11/92)*
Rule 1470	Requirements for Stationary Diesel-Fueled Internal Combustion and Other Compression Ignition Engines

REGULATION XX REGIONAL CLEAN AIR INCENTIVES MARKET (RECLAIM)

Rule 2004	Requirements *(Amended 5/11/01)*
Rule 2011	Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SO_X) Emissions *(Amended 5/11/01)*
Rule 2012	Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Nitrogen (NO_X) Emissions *(Amended 5/11/01)*

REGULATION XXX - TITLE V PERMITS

Rule 3002	Requirements *(Amended 11/14/97)*
Rule 3003	Applications *(Amended 3/16/01)*

CALIFORNIA HEALTH AND SAFETY CODE § 41700

41700	Violation of General Limitations
41954	Compliance for Control of Gasoline Vapor Emissions
41960.2	Gasoline Vapor Recovery

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 10

REPORT: Lead Agency Projects and Environmental Documents Received by the SCAQMD

SYNOPSIS: This report provides, for the Board's consideration, a listing of CEQA documents received by the SCAQMD between December 1, 2014 and December 31, 2014, and those projects for which the SCAQMD is acting as lead agency pursuant to CEQA.

COMMITTEE: Mobile Source, January 23, 2015, Reviewed

RECOMMENDED ACTION:
Receive and file.

Barry R. Wallerstein, D.Env.
Executive Officer

EC:LT:SN:MK:JB:AK

CEQA Document Receipt and Review Logs (Attachments A and B) – Each month, the SCAQMD receives numerous CEQA documents from other public agencies on projects that could adversely affect air quality. A listing of all documents received and reviewed during the reporting period of December 1, 2014, through December 31, 2014 is included in Attachment A. A list of active projects from previous reporting periods for which SCAQMD staff is continuing to evaluate or has prepared comments is included as Attachment B.

The Intergovernmental Review function, which consists of reviewing and commenting on the adequacy of the air quality analysis in CEQA documents prepared by other lead agencies, is consistent with the Board's 1997 Environmental Justice Guiding Principles and Initiative #4. Consistent with the Environmental Justice Program Enhancements for FY 2002-03 approved by the Board in September 2002, each of the attachments notes those proposed projects where the SCAQMD has been contacted regarding potential air quality-related environmental justice concerns. The SCAQMD has established an internal central contact to receive information on projects with potential air quality-related environmental justice concerns. The public may contact the SCAQMD about

projects of concern by the following means: in writing via fax, email, or standard letters; through telephone communication; as part of oral comments at SCAQMD meetings or other meetings where SCAQMD staff is present; or submitting newspaper articles. The attachments also identify for each project the dates of the public comment period and the public hearing date, as reported at the time the CEQA document is received by the SCAQMD. Interested parties should rely on the lead agencies themselves for definitive information regarding public comment periods and hearings as these dates are occasionally modified by the lead agency.

At the January 6, 2006 Board meeting, the Board approved the Workplan for the Chairman's Clean Port Initiatives. One action item of the Chairman's Initiatives was to prepare a monthly report describing CEQA documents for projects related to goods movement and to make full use of the process to ensure the air quality impacts of such projects are thoroughly mitigated. In response to describing goods movement CEQA documents, Attachments A and B are organized to group projects of interest into the following categories: goods movement projects; schools; landfills and wastewater projects; airports; and general land use projects, etc. In response to the mitigation component, guidance information on mitigation measures were compiled into a series of tables relative to: off-road engines; on-road engines; harbor craft; ocean-going vessels; locomotives; fugitive dust; and greenhouse gases. These mitigation measure tables are on the CEQA webpages portion of the SCAQMD's website. Staff will continue compiling tables of mitigation measures for other emission sources including airport ground support equipment, etc.

As resources permit, staff focuses on reviewing and preparing comments for projects: where the SCAQMD is a responsible agency; that may have significant adverse regional air quality impacts (e.g., special event centers, landfills, goods movement, etc.); that may have localized or toxic air quality impacts (e.g., warehouse and distribution centers); where environmental justice concerns have been raised; and those projects for which a lead or responsible agency has specifically requested SCAQMD review. If the SCAQMD staff provided written comments to the lead agency as noted in the column "Comment Status", there is a link to the "SCAQMD Letter" under the Project Description. In addition, if the SCAQMD staff testified at a hearing for the proposed project, a notation is provided under the "Comment Status." If there is no notation that the SCAQMD staff testified, then staff did not provide testimony at a hearing for the proposed project.

During the period December 1, 2014 through December 31, 2014, the SCAQMD received 109 CEQA documents. Of the total of 139 documents listed in Attachments A and B:

- 50 comment letters were sent;
- 12 documents were reviewed, but no comments were made;

- 27 documents are currently under review;
- 2 documents did not require comments (e.g., public notices, plot plans, Final Environmental Impact Reports);
- 1 documents were not reviewed; and
- 47 were screened without additional review.

Copies of all comment letters sent to lead agencies can be found on the SCAQMD's CEQA webpage at the following internet address: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency/comment-letter-year-2014.

SCAQMD Lead Agency Projects (Attachment C) – Pursuant to CEQA, the SCAQMD periodically acts as lead agency for stationary source permit projects. Under CEQA, the lead agency is responsible for determining the type of CEQA document to be prepared if the proposal is considered to be a "project" as defined by CEQA. For example, an Environmental Impact Report (EIR) is prepared when the SCAQMD, as lead agency, finds substantial evidence that the proposed project may have significant adverse effects on the environment. Similarly, a Negative Declaration (ND) or Mitigated Negative Declaration (MND) may be prepared if the SCAQMD determines that the proposed project will not generate significant adverse environmental impacts, or the impacts can be mitigated to less than significance. The ND and MND are written statements describing the reasons why proposed projects will not have a significant adverse effect on the environment and, therefore, do not require the preparation of an EIR.

Attachment C to this report summarizes the active projects for which the SCAQMD is lead agency and is currently preparing or has prepared environmental documentation. Through the end of December, the SCAQMD certified CEQA documents for two permit projects, and released one Lead Agency CEQA document for public review. As noted in Attachment C, through the end of December 2014, the SCAQMD continued working on the CEQA documents for ten active projects.

In the year 2014, SCAQMD staff has been responsible for preparing or having prepared CEQA documents for 12 permit application projects, and certifying CEQA documents for four permit projects.

Attachments

A. Incoming CEQA Documents Log
B. Ongoing Active Projects for Which SCAQMD Has or Will Conduct a CEQA Review
C. Active SCAQMD Lead Agency Projects

ATTACHMENT A*
INCOMING CEQA DOCUMENTS LOG
DECEMBER 1, 2014 TO DECEMBER 31, 2014

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
Goods Movement **LAC141231-05** Berths 226-236 [Everport] Container Terminal Improvements Project #	This document consists of comments from the U.S. EPA on the scope of the upcoming Draft Environmental Impact Statement in response to the NOP. The proposed project consists of the construction and operation of terminal improvements within and adjacent to the Everport Container Terminal. Comment Period: N/A Public Hearing: N/A	Response to Comments	U.S. Army Corps of Engineers	Document does not require comments
Warehouse & Distribution Centers **LAC141223-15** Brickyard Commerce Center #	The proposed project consists of a 1.43-million-square-foot warehouse/distribution building on the main parcel and a 70,000 square-foot light industrial building off the southern flag lot. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/dmndbrickyard.pdf Comment Period: 12/22/2014 - 1/21/2015 Public Hearing: N/A	Draft Negative Declaration	City of Compton	SCAQMD staff commented 1/20/15
Warehouse & Distribution Centers **RVC141202-06** Integra Industrial Project	The proposed project consists of constructing and operating up to 864,000 square feet of industrial warehouse/distribution uses on the approximately 43.2-acre site. Comment Period: N/A Public Hearing: 12/17/2014	Notice of a Public Hearing	City of Perris	Document reviewed - No comments sent
Warehouse & Distribution Centers **RVC141209-09** Integra Perris Distribution Center Project	The proposed project consists of constructing and operating of up to 864,000 square feet of industrial warehouse/distribution uses on the approximately 43.2-acre site. Comment Period: N/A Public Hearing: 12/17/2014	Final Environmental Impact Report	City of Perris	Document reviewed - No comments sent
Warehouse & Distribution Centers **SBC141211-08** Waterman Logistics Center #	The proposed project consists of the development of a 426,858 square-foot logistics warehouse building and associated improvements on 19.65 acres. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/mndwaterman.pdf Comment Period: 12/10/2014 - 1/8/2015 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of San Bernardino	SCAQMD staff commented 1/20/15
Warehouse & Distribution Centers **SBC141223-01** West Valley Logistics Center Specific Plan #	The proposed project consists of the West Valley Logistics Center Specific Plan which would serve as the guiding document to develop an approximately 291 acre site with industrial/ warehousing, public facility and open space land uses within the southern eastern portion of the City of Fontana. The project proposes 3.5 million square feet of industrial and warehouse logistics development. Comment Period: 12/18/2014 - 2/16/2015 Public Hearing: N/A	Notice of Availability of a Draft Environmental Impact Report	City of Fontana	Document under review as of 12/31/14

**Sorted by Land Use Type (in order of land uses most commonly associated with air quality impacts), followed by County, then date received.*

- Project has potential environmental justice concerns due to the nature and/or location of the project.

Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency

** Comment status is current as of Friday, January 23, 2015

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SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
Warehouse & Distribution Centers **SBC141223-12** DRC2014-00567 and Development Review DRC2014-00566	The proposed project consists of a proposal to amend the Development Code to allow buildings with floor areas in excess of 50,000 square feet to be constructed and operated for the purpose of logistics (warehouse/storage/distribution) on parcels that are within the Industrial Park District, and review of a proposal to construct an industrial logistics building of about 116,480 square feet on a parcel of about 249,000 square feet within the Industrial Park District. Comment Period: 12/22/2014 - 1/28/2015 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Rancho Cucamonga	Document screened - No further review conducted
Warehouse & Distribution Centers **SBC141223-17** GPA No. 14-004, General Plan Amendment No. 14-005, Zone Change No. 14-005, Zone Change No. 14-006, Conditional Use Permit No. 14-019, and Design Review No. 14-013	The proposed project consists of the construction and operation of an approximately 763,283-square-foot high-cube warehouse building. Comment Period: N/A Public Hearing: 1/20/2015	Notice of a Public Hearing	City of Fontana	Document reviewed - No comments sent
Airports **LAC141219-06** LAX Master Plan Mitigation Monitoring and Reporting Program (MMRP) 2013 Annual Progress Report	This is the annual progress report to provide a status update of applicable mitigation measures currently being implemented on the approved LAX Master Plan. Comment Period: N/A Public Hearing: N/A	Other	Los Angeles World Airports	Document does not require comments
Industrial and Commercial **LAC141209-04** Amendment No. 1 to the Disney Studios Development Agreement	The proposed project consists of a Master Plan to construct the production and related facilities within the current studio property boundaries, and consolidate many of the Disney employee operations onto the existing studio site within the City of Burbank. The plan allows 1,932,528 Office Equivalency Gross Square Feet of studio and related uses on the project site. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopdisney.pdf Comment Period: 12/8/2014 - 2/5/2014 Public Hearing: N/A	Notice of Preparation	City of Burbank	SCAQMD staff commented 12/17/2014
Industrial and Commercial **LAC141209-10** MGA Mixed-Use Campus Project	The proposed project consists of an integrated light industrial corporate office and residential mixed-use campus development project. The project will consist of a mix of uses totaling approximately 1.22 million square feet, including: 1) adaptive re-use and rehabilitation of the former LA Times printing facility for MGA light industrial uses and its corporate headquarters, as well as ancillary creative office space; 2) 700 rental housing units in four main residential buildings; 3) shared recreational campus amenities located throughout the site; and 4) approximately 14,000 square feet of campus and neighborhood serving retail and restaurant uses. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/deirmga.pdf Comment Period: 12/4/2014 - 1/20/2015 Public Hearing: N/A	Draft Environmental Impact Report	City of Los Angeles	SCAQMD staff commented 1/20/15

- Project has potential environmental justice concerns due to the nature and/or location of the project.
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SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
Industrial and Commercial **LAC141210-01** Robertson Lane Hotel	The proposed project consists of the construction and operation of an approximately 509,000 square-foot building. The proposed building would occupy approximately 2,527 gross square feet, consisting of a hotel and commercial uses that would be bisected by a pedestrian walkway. Construction of the proposed project would involve demolition of three of the existing commercial buildings on the site and all three of the existing surface parking lots. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/noprobertson.pdf Comment Period: 12/11/2014 - 1/23/2015 Public Hearing: 1/7/2015	Notice of Preparation	City of West Hollywood	SCAQMD staff commented 12/17/2014
Industrial and Commercial **LAC141211-11** Hotel 220 MPK (Doubletree) Precision Plan	The proposed project consists of developing a six-story, 180-room hotel that includes an approximately 4,059-square-foot restaurant. The proposed hotel would total approximately 97,876 square feet, consisting of the 4,059 square feet of restaurant use along with 1,075 square feet of retail space, 14,727 square feet of common area, and 13,446 square feet for service areas and support facilities, meeting rooms, a business center, a swimming pool, and a fitness center. Comment Period: 12/10/2014 - 1/10/2015 Public Hearing: 1/13/2015	Draft Mitigated Negative Declaration	City of Monterey Park	Document reviewed - No comments sent
Industrial and Commercial **LAC141225-02** ENV-2014-1116/ 4671 E. Huntington Dr. S.; Northeast Los Angeles	The proposed project consists of the construction, use and maintenance of a new two-story, 9,745 square-foot commercial building including an approximately 2,000 square-foot laundromat. Comment Period: 12/25/2014 - 1/14/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
Industrial and Commercial **RVC141205-02** French Valley Airport Center (PP No. 25183 and PM 33691R1)	The proposed project consists of a business park/industrial park development on approximately 82.07 acres within Planning Area 2.0 of Specific Plan No. 265, the Borel Airpark Center Specific Plan adopted in 1994 by Riverside County and within the Sphere of Influence of the City of Temecula and near the City of Murrieta. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/deirfrench.pdf Comment Period: 12/5/2014 - 1/14/2015 Public Hearing: N/A	Draft Environmental Impact Report	County of Riverside	SCAQMD staff commented 1/13/15
Industrial and Commercial **SBC141209-01** Perricone Juices	The proposed project consists of a plot plan application for a 19,182-square-foot building at an existing juice processing facility. Comment Period: 12/3/2014 - 12/17/2014 Public Hearing: N/A	Initial Project Consultation	City of Beaumont	Document screened - No further review conducted

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SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
Waste and Water-related **ALL141219-04** Pre-Stressed Concrete Cylinder Pipe Rehabilitation Program and Second Lower Feeder Rehabilitation Project	The proposed project consists of rehabilitation of existing pipelines. First to be rehabilitated would be the second lower feeder, followed by the Sepulveda Feeder, Rialto Pipeline, and Calabasas Feeder, and Allen McColloch Pipeline over a period of approximately 15 to 20 years. Rehabilitation would include relining pre-stressed concrete cylinder pipelines or installing supplemental or relocated lines. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopprestressed.pdf Comment Period: 12/18/2014 - 1/20/2015 Public Hearing: N/A	Notice of Preparation	Metropolitan Water District of Southern California	SCAQMD staff commented 12/23/2014
Waste and Water-related **LAC141202-07** Hytone Cleaners	The proposed project consists of installing soil vapor extraction equipment at Hytone Cleaners. The equipment will test ways to clean up tetrachloroethylene, trichloroethylene, and trichloroethane that is remaining in the soil below part of the property. Construction activities include the installation of two soil vapor extraction wells and three monitoring wells below the asphalt at the back of the building. Comment Period: N/A Public Hearing: N/A	Community Notice	Department of Toxic Substances Control	Document screened - No further review conducted
Waste and Water-related **LAC141210-02** United Technologies Corporations Canoga Avenue Site (Formerly Pratt & Whitney-Rocketdyne Site)	The proposed project consists of an update of the cleanup activities being conducted at the United Technologies Corporation site. To date, approximately 2,200 tons of soil have been removed and remediated and 5,538,000 gallons of water have been extracted and treated. Comment Period: N/A Public Hearing: N/A	Community Notice	Los Angeles Regional Water Quality Control Board	Document reviewed - No comment sent
Waste and Water-related **LAC141211-09** Downey Groundwater Well Nos. 27 and 28 Project	The proposed project consists of implementing two new water wells to improve water supply reliability within the service area. The two wells would include drilling to approximately 1,500 feet below ground surface; a 660-square-foot building consisting of a well room, chemical area, and electrical room; a 400-horsepower electric pump; emergency generator backup equipment; flow meters, and pipelines. Comment Period: 12/11/2014 - 1/9/2015 Public Hearing: 1/27/2015	Draft Mitigated Negative Declaration	City of Downey	Document screened - No further review conducted
Waste and Water-related **LAC141212-01** KB Gardena Building, LLC Site	The proposed project consists of a Removal Action Workplan to clean up the groundwater at the KB Gardena building site. Comment Period: N/A Public Hearing: N/A	Response to Comments	Department of Toxic Substances Control	Document screened - No further review conducted

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Waste and Water-related **LAC141212-03** Groundwater Reliability Improvement Program (GRIP) Recycled Water Project	The proposed project consists of constructing an advanced water treatment plant (AWTP) at 4220 San Gabriel River Parkway, in the City of Pico Rivera rather than at the San Jose Creek Water Reclamation Plant (SJCWRP) as described in the previous EIR. The new project alternative would eliminate the need to construct the 3.7-mile pipeline from the SJCWRP by using an existing outfall pipeline along the San Gabriel River to the proposed AWTP, prior to being conveyed to the Montebello Forebay Spreading Grounds for groundwater recharge. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopgroundwater.pdf Comment Period: 12/12/2014 - 1/20/2015 Public Hearing: N/A	Notice of Preparation	Water Replenishment District of Southern California	SCAQMD staff commented 12/18/2014
Waste and Water-related **LAC141216-04** Soil Gas Investigation Results BKK Landfill Facility	The proposed project consists of results from the soil gas investigation results. Based on the sampling results, DTSC concluded that low concentrations of methane and volatile organic compounds, in particular 1,3 butadiene, detected in offsite soil gas do not pose unacceptable risks to residents and others in the vicinity of the facility. Comment Period: N/A Public Hearing: N/A	Community Notice	Department of Toxic Substances Control	Document screened - No further review conducted
Waste and Water-related **LAC141216-06** Malibu High School Building G Area	The proposed project consists of cleanup actions to remove surface soil contaminated with polychlorinated biphenyls located at the Malibu High School Building G Area. Reference LAC141106-13. Comment Period: N/A Public Hearing: N/A	Community Notice	Department of Toxic Substances Control	Document screened - No further review conducted
Waste and Water-related **LAC141230-01** Class 3 Hazardous Waste Facility Permit-Edwards Air Force Base	The proposed project consists of a Notice of Decision to issue a Class 3 Hazardous Waste Facility Permit. Comment Period: N/A Public Hearing: N/A	Other	Department of Toxic Substances Control	Document screened - No further review conducted
Waste and Water-related **LAC141230-03** Groundwater Removal Action Workplan, Avalon Triangle Site	The proposed project consists of a Removal Action Workplan that proposes a cleanup technology knows as In-Situ Chemical Oxidation to treat chemicals found in groundwater at the site. Comment Period: N/A Public Hearing: N/A	Response to Comments	Department of Toxic Substances Control	Document screened - No further review conducted

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Waste and Water-related **LAC141230-05** Former Apex Metal Polishing Site	This document consists of a community survey for the proposed environmental investigation and cleanup activities for hazardous substances that were released into the soil and groundwater. Comment Period: 12/30/2014 - 2/2/2015 Public Hearing: N/A	Community Notice	Department of Toxic Substances Control	Document screened - No further review conducted
Waste and Water-related **ORC141217-03** La Palma Recharge Basin Project	The proposed project consists of the construction and operation of a 14-acre groundwater recharge basin. The project will add an estimated 51,000-acre-feet-per-year of capacity of water recharge into the Orange County Groundwater Basin. Comment Period: 12/17/2014 - 2/5/2015 Public Hearing: N/A	Draft Environmental Impact Report	Orange County Water District	Document reviewed - No comment sent
Waste and Water-related **ORC141218-07** Yorba Linda Pump Station Abandonment Project	The proposed project consists of demolishing the existing Yorba Linda Pump Station, as well as an existing below-ground force main and two gravity sewer lines. Comment Period: 12/18/2014 - 1/17/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	Orange County Sanitation District	Document reviewed - No comment sent
Waste and Water-related **RVC141203-02** Heacock Channel Project	The proposed project consists of a multi-jurisdiction endeavor involving improvements to the existing undersized earthen Heacock Channel. The proejt is contained within the Riversidie County Flood Control & Water Conservation District. Comment Period: N/A Public Hearing: N/A	Final Environmental Impact Report	March Joint Powers Authority	Document screened - No further review conducted
Waste and Water-related **RVC141218-08** Monroe MDP Channel, Stage 4	The proposed project consists of removing the existing trapezoidal channel and constructing approximately 2,070 feet of reinforced concrete box ranging from 8-feet wide by 4-feet high to 14-feet wide by 5-feet high. Comment Period: 12/18/2014 - 1/16/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	County of Riverside	Document screened - No further review conducted
Waste and Water-related **RVC141219-01** Lee Lake Water District Proposed Annexation Adjustments of Lee Lake Water District's and Elsinore Valley Municipal Water District's Service Areas	The proposed project consists of a sphere amendment and/or annexation of three parcels in unincorporated Riverside County. Comment Period: 12/16/2014 - 1/14/2015 Public Hearing: 1/27/2015	Notice of Availability of a Draft Negative Declaration	Lee Lake Water District	Document screened - No further review conducted

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Waste and Water-related **RVC141219-02** CUP No. 3713	The proposed project consists of a conditional use permit to build a recycling and processing facility that converts clean palm frond waste into livestock feed. The site includes an existing 7,500-square-foot steel warehouse building for dry feed storage, offices and restrooms, along with three outdoor finished product stock piles, and a grinder, on an existing 90,000-square-foot asphalt pad. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/pcrivercup3713.pdf Comment Period: 12/19/2014 - 1/8/2015 Public Hearing: N/A	Initial Project Consultation	County of Riverside	SCAQMD staff commented 1/2/15
Waste and Water-related **RVC141223-02** San Jacinto River Levee, Stage 4 and River Corridor Expansion Project	The proposed project consists of the expanded implementation of the 1975 Flood Control Master Plan for the Lower San Jacinto River Basin. The project will provide the 100-year flood protection of approximately 1,955 acres of existing agriculture, active dairy operations, and roadways. Comment Period: 12/19/2014 - 2/2/2015 Public Hearing: N/A	Notice of Availability of a Draft Environmental Impact Report	City of San Jacinto	Document screened - No further review conducted
Waste and Water-related **SBC141202-03** Western San Bernardino County Distribution System Infrastructure Protection Program	The proposed project consists of a comprehensive program to design and implement projects to address surface infrastructure repair and protection needs, while simultaneously implementing a plan for conducting routine operation and maintenance activities in the Western San Bernardino County Operating Region in order to ensure continued water supply reliability. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopwesternsb.pdf Comment Period: 11/25/2014 - 1/9/2015 Public Hearing: N/A	Notice of Preparation	Metropolitan Water District of Southern California	SCAQMD staff commented 12/10/2014
Utilities **LAC141211-04** ENV-2014-3215/ 25219 SW. Doble Ave.; Wilmington-Harbor City	The proposed project consists of a conditional use permit to allow the construction/installation of an unmanned wireless telecommunications facility consisting of 12 panel antennas with support devices in three sectors on a 54-foot monopine, one GPS antenna and generator with an 11-foot pre-fabricated equipment shelter. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20143215.pdf Comment Period: 12/11/2014 - 12/31/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/16/2014
Utilities **LAC141225-05** ENV-2014-3363/ 1302 W. 1st St./ 1301 W. 2nd St.; Westlake	The proposed project consists of permitting the installation, use and maintenance of an unmanned wireless telecommunications facility consisting of a freestanding 55-foot tall monopine with 12 panel antennas, 12 remote radio units, two raycaps, and one microwave antenna, with two equipment cabinets and one backup power generator at ground level to be screened by an eight-foot fence and new landscaping. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/mndcell20143363.pdf Comment Period: 12/25/2014 - 1/14/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 1/2/15

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Utilities **LAC141225-06** ENV-2014-3373/ 4806 S. Arlington Ave.; West Adams-Baldwin Hills-Leimert	The proposed project consists of permitting the installation, use, and maintenance of an unmanned wireless telecommunications facility consisting of a freestanding 50-foot tall monopine with 12 panel antennas, 12 remote radio units, two raycaps, and one microwave antenna, with equipment cabinets and one backup power generator at ground level to be screened by a six-foot fence/solid masonry wall and new landscaping, all located on a 6,100-square-foot lot. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/mndcell20143373.pdf Comment Period: 12/25/2014 - 1/14/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 1/2/15
Utilities **LAC141225-09** ENV-2014-3368/ 1063-1071 S. La Brea Ave.; Wilshire	The proposed project consists of the installation, use and maintenance of an unmanned wireless telecommunications facility consisting of a freestanding 50-foot tall monopine with 12 panel antennas, 12 remote radio units, three raycaps, and one GPS antenna with two equipment cabinets and one backup power generator at ground level to be screened by an eight-foot fence/wall and new landscaping. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/mndcell20143368.pdf Comment Period: 12/25/2014 - 1/14/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 1/2/15
Utilities **SBC141204-01** 14-CUP-15 (Noble Creek)	The proposed project consists of a disguised wireless telecommunication facility that includes the installation of a 60-foot monopine to include 12 panel antenna and one parabolic antenna. All associated ground equipment will be placed adjacent to the proposed monopine surrounded by a proposed eight-foot block wall. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/projconsultnoble.pdf Comment Period: 12/4/2014 - 12/16/2014 Public Hearing: N/A	Initial Project Consultation	City of Beaumont	SCAQMD staff commented 12/1/2014
Transportation **LAC141217-01** 7th Street/ Metro Portal Connection to the Bloc (KOP D)	The proposed project consists of constructing an underground pedestrian passageway below 7th Street in Downtown Los Angeles to connect the existing 7th Street/Metro center subway station to the mixed-use development called the Bloc. The tunnel will be 17-feet in length and 20-feet wide by 15-feet high. Comment Period: 12/16/2014 - 1/14/2015 Public Hearing: N/A	Draft Mitigated Negative Declaration	Los Angeles County Metropolitan Transportation Authority	Document screened - No further review conducted
Institutional (schools, government, etc.) **LAC141204-02** Tentative Parcel Map No. 72846 and Street Vacation - Los Angeles Unified School District - South Region High School No. 8	The proposed project consists of combining several parcels of land into one parcel, including the street vacation of 58th Street between King Avenue and Mayflower Ave, along with necessary street dedications, for the construction of the new South Region High School No. 8. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/pctpm72846.pdf Comment Period: 12/4/2014 - 1/5/2015 Public Hearing: N/A	Initial Project Consultation	City of Maywood	SCAQMD staff commented 12/30/2014

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Institutional (schools, government, etc.) **LAC141209-05** Pomona College 2015 Campus Master Plan EIR	The proposed project consists of a long-range Master Plan for planned future improvements to the Pomona College campus over a period of 15 years from the date of the City approval of the Master Plan. Comment Period: 12/8/2014 - 2/6/2015 Public Hearing: N/A	Draft Environmental Impact Report	City of Claremont	Document under review as of 12/31/14
Institutional (schools, government, etc.) **LAC141231-01** UCLA Basketball Practice Facility Project	The proposed project consists of constructing and operating a new Basketball Practice Facility of up to 37,000 gross square feet. Comment Period: 12/23/2014 - 1/21/2015 Public Hearing: N/A	Draft Mitigated Negative Declaration	University of California, Los Angeles	Document screened - No further review conducted
Institutional (schools, government, etc.) **RVC141202-02** Sycamore Canyon Academy	The proposed project consists of developing a public K through 8 charter school on a 9.7-acre vacant lot. More specifically, the proposed project consists of an approximately 28,000-square-foot K though 8 public charter school including 22 classrooms arranged in four buildings, a flex-classroom, and an administration building as well as patio space, parking lots, gardens, an amphitheater, and paved and turf play area. Comment Period: 12/1/2014 - 12/30/2014 Public Hearing: N/A	Initial Study	City of Wildomar	Document reviewed - No comments sent
Institutional (schools, government, etc.) **RVC141202-04** Riverside Free Methodist Church Demolition Project	The proposed project consists of demolishing the existing Riverside Free Methodist Church complex. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopriversidefree.pdf Comment Period: 12/1/2014 - 12/30/2014 Public Hearing: N/A	Notice of Preparation	City of Riverside	SCAQMD staff commented 12/10/2014
Institutional (schools, government, etc.) **RVC141231-04** Menifee Union School District - District Education Center Plot Plan No. 2014-146 (PP 2014-146)	The proposed project consists of constructing and operating a two-story, 44,932-square-foot concrete tilt-up office building for the Menifee Union School District to serve as the District Education Center. Reference RVC140624-03 Comment Period: N/A Public Hearing: 1/14/2015	Addendum Environmental Impact Report	City of Menifee	Document screened - No further review conducted
Retail **RVC141205-01** MA14160	The proposed project consists of demolishing an existing auto repair structure and constructing a new Arco gas station to include a 2,900-square-foot convenience store; a 3,258.5-square-foot canopy; and 768-square-foot automated/drive-thru car wash. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/pcma14160.pdf Comment Period: 12/5/2014 - 12/18/2014 Public Hearing: N/A	Initial Project Consultation	City of Jurupa Valley	SCAQMD staff commented 12/11/2014

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Retail **RVC141223-11** Fast Track General Plan Amendment No. 1109/ Change of Zone No. 7784/ Tentative Parcel map No. 36443, Amendment Map No. 1/ Plot Plan No. 15946R1, Amended No. 1	The proposed project consists of expanding the Cabazon Outlet II stores by constructing an additional 79,150 square feet of commercial retail center space. Comment Period: N/A Public Hearing: N/A	Initial Project Consultation	County of Riverside	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141204-04** ENV-2014-3375/ 13245 W. Hubbard St.; Sylmar	The proposed project consists of developing 22 single-family dwellings on 22 separate lots on a 70,645-square-foot site. The project will include the demolition of an approximately 60-year-old single-family dwelling unit. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/dmndhubbard.pdf Comment Period: 12/4/2014 - 12/26/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/17/2014
General Land Use (residential, etc.) **LAC141204-05** ENV-2014-1094/ 611 W. Gayley Ave.; Westwood	The proposed project consists of the construction, use and maintenance of a new 22-room, four-story 15,481-square-foot fraternity house over a subterranean garage featuring 31 parking spaces. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndgayley.pdf Comment Period: 12/4/2014 - 12/26/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/12/2014
General Land Use (residential, etc.) **LAC141204-06** ENV-2014-2786/ 6000 W. Pico Blvd.; Wilshire	The proposed project consists of an addition of 333 square feet to an existing synagogue to create a new floor area of 3,396 square feet featuring 2,118 square feet of assembly area, all on a 4,107-square-foot lot. Comment Period: 12/4/2014 - 12/26/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141204-07** ENV-2014-2952/ 2956-2990 N. Allesandro St.; Silver Lake-Echo Park-Elysian Valley	The proposed project consists of demolishing seven dwelling units and six temporary sheds and constructing a 52,476 square-foot mixed-use building that consists of 40 live-work units and 16,094 square feet of commercial uses on the ground floor. Comment Period: 12/4/2014 - 12/26/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document reviewed - No comments sent

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General Land Use (residential, etc.) **LAC141204-08** ENV-2014-3008/ 811 S. Ocean Front Walk; Venice	The proposed project consists of a permit to demolish two existing residential buildings containing a total of nine dwelling units, and the construction of a new 35-foot tall, 2,691-square-foot restaurant on the ground floor with two residential units above totaling 8,456 square feet. Comment Period: 12/4/2014 - 1/5/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141204-09** ENV-2014-3551/ 9262 W. Robin Dr.; Hollywood	The proposed project consists of demolishing an existing 4,482-square-foot single-family dwelling and pool; and the construction of a 5,746-square-foot single family dwelling with a partial basement and pool. Comment Period: 12/4/2014 - 12/26/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141204-10** ENV-2014-943/ 16140 W. Chase St.; Mission Hills-Panorama City-North Hills	The proposed project consists of developing 73 single-family dwellings on an approximately 10.96 acre site. The project will include hauling of approximately 20,000 cubic yards. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndchase.pdf Comment Period: 12/4/2014 - 12/26/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/17/2014
General Land Use (residential, etc.) **LAC141209-02** Tentative Parcel Map 73055	The proposed project consists of a Tentative Parcel Map application to subdivide an existing 1.686 acre residential lot into three residential lots. Comment Period: 12/9/2014 - 1/5/2015 Public Hearing: N/A	Initial Project Consultation	City of Walnut	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141209-08** Zoning Case No. 869, Subdivision No. 94, Vesting Tentative Parcel Map No. 72775	The proposed project consists of a request to subdivide an existing lot totaling 7.05 gross acres into two parcels. Comment Period: 12/9/2014 - 1/5/2015 Public Hearing: 1/20/2015	Draft Mitigated Negative Declaration	City of Rolling Hills	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141210-03** 100 W. Walnut Planned Development	The proposed project consists of converting a 22.67-acre project site from a single-function office complex with over 900,000 square feet, which features the 12-story Parsons Corporation tower, to a mixed-use office campus and residential community. Comment on DEIR sent 7/17/14. Comment Period: N/A Public Hearing: 1/14/2015	Final Environmental Impact Report	City of Pasadena	Document reviewed - No comments sent

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General Land Use (residential, etc.) **LAC141211-01** ENV-2014-2866/ 2631 S. Crenshaw Blvd.; West Adams-Baldwin Hills-Leimert	The proposed project consists of demolishing a structure with total floor area of 13,043 square feet on a 21,002-square-foot lot, the removal of an existing billboard sign and surface parking lot, and the construction of a mixed-use building with 50 residential dwelling units and 4,999 square feet of neighborhood-serving commercial uses. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mnd20142866.pdf Comment Period: 12/11/2014 - 12/31/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/30/2014
General Land Use (residential, etc.) **LAC141211-02** ENV-2014-3226/ 738-740 S. Ogden Dr.; Wilshire	The proposed project consists of the construction, use, and maintenance of 12 new residential condominium units within a new four-story building. Comment Period: 12/11/2014 - 12/31/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141211-03** ENV-2014-2806/ 3411 S. Crenshaw Blvd.; West Adams-Baldwin Hills-Leimert	The proposed project consists of demolishing four structures and constructing a mixed-use building with 49 residential dwelling units and 5,642 square feet of neighborhood-serving commercial uses. Comment Period: 12/11/2014 - 12/31/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	No review conducted - No comments sent
General Land Use (residential, etc.) **LAC141211-05** ENV-2013-4170/3598 Alta Mesa Dr.; Sherman Oaks-Studio City-Toluca Lake-Cahuenga Pass	The proposed project consists of a one- and two-story addition of approximately 1,693 square feet to an existing 3,412-square-foot two-story single-family dwelling for a total of 5,105 square feet. Approximately 61 cubic yards of dirt will be exported. Comment Period: 12/11/2014 - 1/12/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141211-06** Slauson Sidewalk Improvement Project	The proposed project consists of removing 111 ficus trees to repair damages caused by root growth to sidewalk, driveways, curbs, gutters, and streets. Comment Period: 12/11/2014 - 1/12/2015 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Commerce	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141211-12** Hollywood Cherokee Project	The proposed project consists of constructing a six-story, 224-unit residential apartment/condominium building on a 1.14-acre site in the Hollywood Community of the City of Los Angeles. Comment Period: 12/11/2014 - 1/27/2015 Public Hearing: N/A	Draft Environmental Impact Report	City of Los Angeles	Document reviewed – No Comment sent

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General Land Use (residential, etc.) **LAC141216-02** City Ventures - Alhambra	The proposed project consists of the construction of a planned development of 30 townhome units and 40 single-family residential dwelling units on approximate 8.8 acres. The townhomes will range in size from approximately 1,252 to 1,948 square feet. Comment Period: N/A Public Hearing: 1/20/2015	Notice of Availability of a Recirculated Mitigated Negative Declaration	City of Alhambra	Document reviewed - No comments sent
General Land Use (residential, etc.) **LAC141216-03** Century City Center Development	The proposed project consists of developing approximately 483 residential condominiums in two 47-story towers and one 12-story building for a total of approximately 1.3 million square feet on an approximately 5.5-acre site. Comment Period: N/A Public Hearing: N/A	Final Subsequent Environmental Impact Report	City of Los Angeles	Document reviewed - No comments sent
General Land Use (residential, etc.) **LAC141217-04** 2400 South Fremont Specific Plan	The proposed project consists of demolition of all existing on-site improvements and implementation of a Specific Plan for a 70-unit residential development. Implementation of the Specific Plan will result in the construction of a planned development of 30 two- and three-story townhome units and 40 one-, two- and three-story single family dwelling units. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndfremont.pdf Comment Period: 12/17/2014 - 1/5/2015 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Alhambra	SCAQMD staff commented 12/31/2014
General Land Use (residential, etc.) **LAC141218-01** ENV-2014-2444/11580-11594 W. Riverside Dr. and 4748-4752 N. Irvine Ave.; North Hollywood-Valley Village	The proposed project consists of the demolition of three residential buildings and three detached garages and construction of 16 single-family dwellings on three existing lots totaling 20,795 square feet. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mnd20142444.pdf Comment Period: 12/18/2014 - 1/7/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/30/2014
General Land Use (residential, etc.) **LAC141218-02** ENV-2011-1425/ 10580 W. Selkirk Ln.; Bel Air-Beverly Crest	The proposed project consists of the construction, use and maintenance of a new 5,885 square-foot two-story single-family dwelling with attached garage and swimming pool. Comment Period: 12/18/2014 - 1/7/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted

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General Land Use (residential, etc.) **LAC141218-03** ENV-2014-3490/ 1369 N. Londonderry Pl.; Hollywood	The proposed project consists of demolishing an existing 2,808-square-foot, 63-year old, single-family dwelling and pool, and the construction of a 7,780-square-foot single-family dwelling. The project requires an approval of a haul route to permit exporting 4,874 cubic yards of soil. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mnd20143490.pdf Comment Period: 12/18/2014 - 1/7/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/31/2014
General Land Use (residential, etc.) **LAC141218-04** ENV-2014-2147/ 1319 N. Martel Ave.; Hollywood	The proposed project consists of the demolition of two existing 3,860-square-foot triplexes and the construction of a four-story, 32,094-square-foot, 23-unit apartment with a subterranean garage on a site with an area of 13,600 square feet. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mnd20142147.pdf Comment Period: 12/18/2014 - 1/7/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/30/2014
General Land Use (residential, etc.) **LAC141218-05** ENV-2014-3881/ 10663 W. Kinnard Ave.; Westwood	The proposed project consists of subdividing land to create six ground lots and the construction, use and maintenance of up to six new residential condominiums on a 6,501-square-foot lot. Comment Period: 12/18/2014 - 1/7/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141219-03** Baldwin Hills Crenshaw Plaza Master Plan Project	The proposed project consists of redeveloping the existing Baldwin Hills Crenshaw Plaza, which will result in a mixed-use retail, commercial, office, hotel, and residential project totaling approximately 3,072,956 square feet of net floor area. Approximately 90,898 square feet of the existing free-standing structures will be demolished, and all of the enclosed mall structure and cinema would be retained. Comment Period: 12/18/2014 - 2/17/2015 Public Hearing: N/A	Draft Environmental Impact Report	City of Los Angeles	Document under review as of 12/31/14
General Land Use (residential, etc.) **LAC141219-05** Dhammakaya International Meditation Center Specific Plan	The proposed project consists of demolishing several existing on-site structures including the Montserat building, the Xavier center meeting hall, and eight one-story dormitory buildings. Implementation of the Specific Plan will result in several improvements to the Dhammakaya International Meditation Center including the construction of a 69,179-square-foot meditation hall, nine two-story dormitory buildings, a storage/workshop building, a storm water detention/water quality basin, a fire access road, additional parking, a reflecting pool, and landscaping. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopdhammakaya.pdf Comment Period: 12/19/2014 - 1/18/2015 Public Hearing: N/A	Notice of Preparation	City of Azusa	SCAQMD staff commented 12/23/2014

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General Land Use (residential, etc.) **LAC141225-01** ENV-2014-3484/ 1100, 1102, 1104 S. Corning Street., and 8520, 8524 W. Whitworth Dr.; Wilshire	The proposed project consists of demolishing an existing apartment building with two dwelling units and the construction of a seven-unit residential condominium. Approximately 3,000 cubic yards of dirt will be exported from the site. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/mnd20143484.pdf Comment Period: 12/25/2014 - 1/15/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 1/9/15
General Land Use (residential, etc.) **LAC141225-03** ENV-2014-2030/ 808 N. Stradella Rd.; Bel Air-Beverly Crest	The proposed project consists of the demolition of an existing single-family dwelling, pool, and pool house and the construction of a new two-story, single-family dwelling with basement and subterranean garage. Comment Period: 12/25/2014 - 1/14/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141225-04** ENV-2014-2969/ 304 N. Crane Blvd; Northeast Los Angeles	The proposed project consists of the construction of a 3,009-square-foot single-family dwelling on a vacant 6,430-square-foot lot. Comment Period: 12/25/2014 - 1/14/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141225-08** ENV-2014-1436/5628 N. Sepulveda Blvd.; Van Nuys-North Sherman Oaks	The proposed project consists of a 78-room addition to an existing 96-room four-story hotel. Approximately 6,000 cubic yards of dirt and asphalt will be exported. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/mnd20141436.pdf Comment Period: 12/25/2014 - 1/14/2015 Public Hearing: N/A	Notice of Availability of a Draft Negative Declaration	City of Los Angeles	SCAQMD staff commented 1/14/15
General Land Use (residential, etc.) **LAC141230-02** Century City Center	The proposed project consists of developing approximately 483 residential condominiums in two 47-story towers and one 12-story building for a total of approximately 1.3 million square feet on an approximately 5.5-acre site. Reference LAC141216-03 Comment Period: N/A Public Hearing: 1/13/2015	Notice of a Public Hearing	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141230-04** Butterfly Garden Park	The proposed project consists of a General Plan Amendment, Zone Change and Tentative Parcel Map for a proposed Butterfly Garden/Park on six existing lots. Comment Period: N/A Public Hearing: 1/15/2015	Community Notice	City of Bellflower	Document screened - No further review conducted

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General Land Use (residential, etc.) **LAC141231-02** Platinum Row Specific Plan	The proposed project consists of a specific plan for a 96-unit townhouse community. The site totals 4.69 acres and is currently operating as a commercial landscaping nursery. Comment Period: 12/26/2014 - 1/14/2015 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Gardena	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141231-06** 702-714 N. Doheny Drive Condominiums Project	The proposed project consists of demolishing two existing single-family residential dwelling units and associated features, and the development of 38 market-rate condominiums and 12 affordable apartments at varying income levels in a three- and four-story residential building. Comment Period: 12/24/2014 - 1/15/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of West Hollywood	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141231-07** Downtown TOD Specific Plan	The proposed project consists of a Specific Plan that will provide a mix of residential, employment, retail, and public uses in the downtown area and would guide future development to create a transit-oriented environment. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/nopdowntowntod.pdf Comment Period: 12/31/2014 - 2/5/2015 Public Hearing: N/A	Notice of Preparation	City of Baldwin Park	SCAQMD staff commented 1/7/15
General Land Use (residential, etc.) **ORC141204-11** Westgate Residential Project Case No. 2014-69	The proposed project consists of a Tentative Tract Map to allow for the assemblage and subsequent subdivision of five parcels currently developed with an industrial use, a church, and residential dwelling units, totaling 7.17 acres. The existing on-site structures would be removed and the proposed development would consist of 79 new single-family detached cluster homes in a gated community with private streets and landscaping. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndmaplewillow.pdf Comment Period: 12/4/2014 - 1/2/2015 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Westminster	SCAQMD staff commented 12/19/2014
General Land Use (residential, etc.) **ORC141209-06** Laguna Canyon Creek Erosion Control and Restoration Project	The proposed project consists of restoring the Laguna Canyon Creek's hydrological and biological functions along the 270 linear feet of creek on city property at 20612 Laguna Canyon Road. Comment Period: 12/9/2014 - 1/7/2015 Public Hearing: 12/17/2014	Draft Mitigated Negative Declaration	City of Laguna Beach Public Works Department	Document screened - No further review conducted
General Land Use (residential, etc.) **ORC141209-09** Esperanza Hills Project	The proposed project consists of constructing 340 single-family residential units on 468.9 acres. The project will retain approximately 129 acres of natural open space and 126 acres of landscaping and irrigated slopes as part of a fuel modification plan. Comment Period: N/A Public Hearing: 1/14/2015	Notice of Availability of a Final Environmental Impact Report	County of Orange	Document reviewed – No comment sent

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General Land Use (residential, etc.) **ORC141223-05** Case No. 2014-84	The proposed project consists of a Tentative Tract Map to allow for the subdivision of an existing 1.83 acre lot into two parcels and 37 condominium units. The existing structures would be removed and the proposed development would consist of 37 new live/work condominium units with interior drive aisles, surface parking, pedestrian walkways, and landscaping. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/mndmaple201484.pdf Comment Period: 12/23/2014 - 1/21/2015 Public Hearing: 2/18/2015	Notice of a Public Hearing	City of Westminster	SCAQMD staff commented 1/16/15
General Land Use (residential, etc.) **ORC141231-03** La Habra Civic Center Infill Housing	The proposed project consists of the development of up to 110 new homes on approximately 5.5 acres within and adjacent to the City of La Habra's Civic Center. Comment Period: 12/31/2014 - 2/11/2015 Public Hearing: N/A	Draft Environmental Impact Report	City of La Habra	Document screened - No further review conducted
General Land Use (residential, etc.) **RVC141202-05** City of Perris	The proposed project consists of the Harvest Landing Specific Plan. The proposed revisions include a revised phasing plan that will allow high and high- low density residential/ commercial uses, and includes construction of the Harvest Lake in Phase I. Comment Period: 12/2/2014 - 12/17/2014 Public Hearing: N/A	Initial Project Consultation	City of Perris	Document screened - No further review conducted
General Land Use (residential, etc.) **RVC141205-04** GPA 2011-3026, ZC 2011-3027 and TTM 2011-3028	The proposed project consists of subdividing the 64.3-acre project area into 53 residential lots, eight lots for Home Owner's Association purposes and seven lettered lots for street and open space purposes. Comment Period: N/A Public Hearing: 12/16/2014	Notice of a Public Hearing	City of Murrieta	Document screened - No further review conducted
General Land Use (residential, etc.) **RVC141209-07** General Plan Amendment (GPA 01123), Specific Plan No. 265, Amendment No. 1, Change of Zone (CZ 07806) and Tentative Tract Map No. 36546 (TTM 36546)	The proposed project consists of a General Plan Amendment, a Specific Plan Amendment, a Change of Zone and a Tentative Tract Map. The project will include the subdivision of 161.8 acres into 281 residential lots. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopttm36546.pdf Comment Period: 12/4/2014 - 1/3/2015 Public Hearing: N/A	Notice of Preparation	County of Riverside	SCAQMD staff commented 12/17/2014

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General Land Use (residential, etc.) **RVC141211-07** Juniper Flats Decanting Facility	The proposed project consists of the construction of two features to decant liquid from solid waste collected during storm drain clean-out operations. The decanting features each consist of a sloped concrete pad of approximately 750 square feet and an adjacent 150-square-foot infiltration trench. The solids will remain on the concrete pad to dry, while the liquid will drain into an adjacent infiltration trench. Comment Period: 12/10/2014 - 1/9/2015 Public Hearing: N/A	Draft Environmental Assessment	County of Riverside	Document screened - No further review conducted
General Land Use (residential, etc.) **RVC141212-02** GPA No. 1129, Change of Zone No. 7856, TTM No. 36785	The proposed project consists of subdividing 170.8 gross acres into 523 residential lots with a 5,500-square-foot minimum lot size, and 25 lettered lots consisting of drainage basins, parks, paseos, and open space. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/pcgpa1129.pdf Comment Period: 12/12/2014 - 1/15/2015 Public Hearing: 1/15/2015	Initial Project Consultation	County of Riverside	SCAQMD staff commented 12/18/2014
General Land Use (residential, etc.) **RVC141216-01** Baxter Village Mixed-Use Project	The proposed project consists of developing a 8.4 net acre site with 75,000 square feet of commercial retail uses, 11.3 net acres with 204 apartment units, and 12.5 net acres with 70 single-family homes. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopbaxter.pdf Comment Period: 12/15/2014 - 1/19/2014 Public Hearing: N/A	Notice of Preparation	City of Wildomar	SCAQMD staff commented 12/19/2014
General Land Use (residential, etc.) **RVC141217-02** Desert Recreation District	The proposed project consists of developing five acres in the unincorporated community of North Shore as a public use neighborhood park under the administration of the Desert Recreation District. The proposed park features include a general purpose sports field, skate plaza, sport court, playground, splash pad, calisthenics exercise circuit, shaded pavilion, community bicycle repair cooperative, parking and restrooms. Comment Period: 12/8/2014 - 1/6/2015 Public Hearing: N/A	Draft Mitigated Negative Declaration	Desert Recreation District	Document reviewed - No comments sent
General Land Use (residential, etc.) **RVC141223-04** Grove Park Mixed-Use Development Project	The proposed project consists of a mixed-use development of approximately 50,000 square feet of commercial/retail and office uses on the northern portion of a 10.3 acre site and eight three-story multiple-family apartment buildings on the southern portion of the site. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/nopgrovepark.pdf Comment Period: 12/23/2014 - 1/19/2015 Public Hearing: N/A	Notice of Preparation	City of Wildomar	SCAQMD staff commented 1/2/15
General Land Use (residential, etc.) **RVC141223-16** Serena Park	The proposed project consists of redeveloping the former golf course with approximately 429 residential units and a five-acre public park. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/nopserena.pdf Comment Period: 12/23/2014 - 1/22/2014 Public Hearing: N/A	Notice of Preparation	City of Palm Springs	SCAQMD staff commented 1/2/15

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General Land Use (residential, etc.) **RVC141223-18** ZAP1027TH14	The City of Coachella is proposing to adopt a new General Plan emphasizing community designs that prioritize active transportation modes such as walking and bicycling, encouraging social interactions, and creating traditional neighborhoods, in order to become a healthier, more sustainable community. Comment Period: N/A Public Hearing: 1/8/2015	Notice of a Public Hearing	Riverside County Airport Land Use Commission	Document screened - No further review conducted
General Land Use (residential, etc.) **SBC141203-01** GPA 14-075, ZMA 14-076; ANX 14-074 and TTM 14-073	The proposed project consists of subdividing the approximate 9.5-acre Bell property into 35 single-family residences. Comment Period: 12/4/2014 - 1/5/2015 Public Hearing: 1/7/2015	Draft Mitigated Negative Declaration	City of Loma Linda	Document screened - No further review conducted
General Land Use (residential, etc.) **SBC141209-03** Brewer Site Project	The proposed project consists of redeveloping a 33.5-acre property currently occupied by approximately eight single-family homes and undeveloped land, for the future construction and operation of a residential community comprising single-family homes and detached condominiums. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopbrewer.pdf Comment Period: 12/9/2014 - 1/9/2015 Public Hearing: N/A	Notice of Preparation	City of Chino	SCAQMD staff commented 12/17/2014
General Land Use (residential, etc.) **SBC141223-13** Tentative Tract Map SUBTT18976 and Design Review DRC2014-00570	The proposed project consists of subdividing a 3.2-acre site and developing 31 detached condominiums. The project site includes two existing single-family residences that will be removed as part of the project. Comment Period: 12/22/2014 - 1/28/2015 Public Hearing: 1/28/2015	Draft Mitigated Negative Declaration	City of Rancho Cucamonga	Document screened - No further review conducted
General Land Use (residential, etc.) **SBC141223-14** Tentative Tract Map SUBTT18966 and Development Review DRC2013-00645	The proposed project consists of subdividing a 1.89-acre property into eight lots and the construction of eight single-family residences. Comment Period: 12/22/2014 - 1/28/2015 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Rancho Cucamonga	Document screened - No further review conducted

- Project has potential environmental justice concerns due to the nature and/or location of the project.
Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency
** Comment status is current as of Friday, January

ATTACHMENT A
INCOMING CEQA DOCUMENTS LOG
DECEMBER 1, 2014 TO DECEMBER 31, 2014

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
Plans and Regulations **LAC141205-03** Focused General Plan and Zoning Ordinance Updates	The proposed project consists of: 1) an update to the Land Use Element of the General Plan to expand the locations where commercial uses and truck and freight terminals can be established in the City; 2) updates to the Land Use, Resources, Safety, and Noise Elements to comply with recent State laws and to update pertinent information; 3) an update to the Implementation Plan with new applicable policies related to the policy changes; 4) revisions to the Zoning Ordinance and Zoning Map to establish and apply a new Truck and Freight Terminal overlay; 5) revisions to the Zoning Ordinance and Zoning Map to replace and expand the existing Commercial Overlay with the new Commercial Overlays; 6) establishing new definitions to address the revisions and other minor amendments to the Zoning Ordinance; 7) establishing a new Minor Conditional Use permit application; 8) providing standards for digital billboards; and 9) performing additional clean-up, non-substantive revisions to the Zoning Ordinance that do not affect any prior policy directives. Comment Period: 12/4/2014 - 1/19/2015 Public Hearing: N/A	Supplemental Environmental Impact Report	City of Vernon	Document reviewed - No comments sent
Plans and Regulations **LAC141216-05** LAX Northside Plan Update	The proposed project consists of the LAX Northside Plan Update. The project would set forth new regulations for future development occurring within the Northside area of the LAX Specific Plan and would include amendments to the LAX Specific Plan. Comment Period: N/A Public Hearing: N/A	Notice of Availability of a Final Environmental Impact Report	Los Angeles World Airports	Document screened - No further review conducted
Plans and Regulations **ORC141202-01** Billboard Overlay Zone Ordinance	The proposed project consists of adopting a Billboard Ordinance and to amend Title 19 of the City's municipal code. The project entails the establishment of a billboard overlay zone and billboard sign standard. Comment Period: 12/2/2014 - 12/15/2014 Public Hearing: 12/17/2014	Draft Negative Declaration	City of Buena Park	Document screened - No further review conducted
Plans and Regulations **ORC141223-03** West Alton	The proposed project consists of a development plan and will include development standards and/or design guidelines that will establish parameters for all future development on the subject property. The City of Irvine's Trails and Transit-Oriented District (TTOD) within the City of Irvine's Zoning Code will serve as the basis on which these development standards and/or design guidelines will be prepared. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/nopwestalton.pdf Comment Period: 12/25/2014 - 1/9/2015 Public Hearing: N/A	Notice of Preparation	County of Orange	SCAQMD staff commented 1/2/15
Plans and Regulations **RVC141204-03** GPA-011-3031, ZC 011-3035, and Tentative Tract Map TTM-011-3030 (TTM 36328)	The proposed project consists of implementing a residential and open space development on an approximate 32-acre site. Comment Period: 12/1/2014 - 12/30/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Murrieta	Document reviewed - No comments sent

- Project has potential environmental justice concerns due to the nature and/or location of the project.

Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency

** Comment status is current as of Friday, January

ATTACHMENT A
INCOMING CEQA DOCUMENTS LOG
DECEMBER 1, 2014 TO DECEMBER 31, 2014

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
Plans and Regulations	The proposed project consists of a request to change the existing General Plan land use designation from R/SO to LI for 7.19 acres of land and a specific plan amendment to allow RV storage as a conditionally permitted use in the EE land use designation of the East Chino Specific Plan. Comment Period: N/A Public Hearing: 1/6/2015	Notice of a Public Hearing	City of Chino	Document screened - No further review conducted
SBC141205-06 PL11-0428 (General Plan Amendment), PL08-0369 (East Chino Specific Plan Amendment), and Certification of the Chino RV Storage Facility EIR				

TOTAL DOCUMENTS RECEIVED AND REVIEWED THIS REPORTING PERIOD: 109

- Project has potential environmental justice concerns due to the nature and/or location of the project.
Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency
** Comment status is current as of Friday, January

ATTACHMENT B*
ONGOING ACTIVE PROJECTS FOR WHICH SCAQMD HAS OR IS CONTINUING TO CONDUCT A CEQA REVIEW

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
Warehouse & Distribution Centers **SBC141128-09** Sierra Pacific Center II Project #	The proposed project consists of the construction and operation of approximately 763,350 net square feet of high-cube logistics warehouse use with associated office and mezzanine spaces. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2015/january/deirsierra.pdf Comment Period: 11/28/2014 - 1/5/2015 Public Hearing: 12/16/2014	Draft Environmental Impact Report	City of Fontana	SCAQMD staff commented 1/2/15
Waste and Water-related **LAC141107-06** Exide Technologies, EPA ID NO. CAD 097 854 541	The proposed project consists of Interim Status Modification and Temporary Authorization request to the State of California, Department of Toxic Substances Control. The Interim Status Modification application addresses one existing miscellaneous unit and one existing tank. Specifically, the existing miscellaneous unit is Centrifuge No. 1. The existing tank is West Yard Truck Wash. Comment Period: 10/31/2014 - 1/6/2015 Public Hearing: N/A	Community Notice	Department of Toxic Substances Control	Document reviewed - No comment sent
Waste and Water-related **LAC141119-01** Former Kast Property Tank Farm Site Remediation Project	The proposed project consists of Remedial Action Plan for the Carousel Tract located in the southern portion of the City of Carson, California. Historically, prior to development of many existing residential uses, the local project vicinity was primarily an industrial area inclusive of numerous oil refineries and other chemical-related facilities, many of which have documented hazardous materials releases. Comment Period: 11/7/2014 - 1/9/2015 Public Hearing: N/A	Draft Environmental Impact Report	State of California Regional Water Quality Control Board	Document reviewed - No comment sent
General Land Use (residential, etc.) **LAC141128-11** Martin Expo Town Center	The proposed project consists of removing all existing structures, and constructing a total of 807,200 square feet of new development. The Conceptual Plan includes 516 residential condominium units, 67,000 square feet of retail floor area, 200,000 square feet of creative office floor area, and associated subterranean parking. The proposed uses may also include an auto showroom. Comment Period: 11/20/2014 - 1/15/2015 Public Hearing: N/A	Draft Environmental Impact Report	City of Los Angeles	Document under review as of 12/31/14
Warehouse & Distribution Centers **RVC141128-05** Optimus Logistics Center I #	The proposed project consists of constructing a high-cube warehouse development consisting of two buildings totaling approximately 1,463,887 square feet on approximately 68.48 acres, with another 10.7 acres left undeveloped for a future commercial development fronting Ramona Expressway and another 9.6 acres left undeveloped for the future Ramona Expressway on-ramp at Interstate 215 Freeway. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/deiroptimus.pdf Comment Period: 11/26/2014 - 1/26/2015 Public Hearing: N/A	Draft Environmental Impact Report	City of Perris	SCAQMD staff commented 12/31/2014
Warehouse & Distribution Centers **SBC141024-02** Modular Logistics Center #	The proposed project consists of the redevelopment of an underutilized 50.84 gross-acre property. The redevelopment process would involve the demolition and removal of existing industrial buildings and associated improvements from the subject property, grading and preparation for the redevelopment, and construction and operation of a logistics warehouse structure containing 1,109,378 square feet of building space and 26 loading bays. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/deirmodular.pdf Comment Period: 10/24/2014 - 12/8/2014 Public Hearing: N/A	Draft Environmental Impact Report	City of Moreno Valley	SCAQMD staff commented 12/2/2014

Sorted by Comment Status, followed by Land Use, then County, then date received.

- Project has potential environmental justice concerns due to the nature and/or location of the project.

Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency

** Comment status is current as of Friday, January 23, 2015

ATTACHMENT B
ONGOING ACTIVE PROJECTS FOR WHICH SCAQMD HAS OR IS CONTINUING TO CONDUCT A CEQA REVIEW

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
Industrial and Commercial **RVC141128-03** MA14144	The proposed project consists of a Site Development Permit for an existing 2,088 square-foot auto body and repair shop. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/pcma14144.pdf Comment Period: N/A Public Hearing: N/A	Initial Project Consultation	City of Jurupa	SCAQMD staff commented 12/5/2014
Waste and Water-related **LAC141021-12** F.E. Weymount Treatment Plant Improvement Program	The proposed project consists of upgrading existing and/or constructing new facilities at the Weymouth Plan to accommodate the plant's maximum operating capacity and update the overall facility. The project would involve rehabilitating and refurbishing aging treatment structures, upgrading systems to improve treatment processes, enhancing worker safety, reducing carbon emissions with renewable energy, improving stormwater management, and ensuring compliance with recent legislation pertaining to the State Drinking Water Act. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/deirweymouth.pdf Comment Period: 10/21/2014 - 12/6/2014 Public Hearing: N/A	Draft Environmental Impact Report	Metropolitan Water District of Southern California	SCAQMD staff commented 12/2/2014
Waste and Water-related **LAC141128-14** Los Angeles County Waterworks District No. 29 Water System Master Plan	The proposed project consists of a Water System Master Plan to meet the water infrastructure needs of the District through the year 2035. The Plan identifies system facilities needed to overcome existing deficiencies and to meet anticipated system requirements through the target planning year. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/noplawatermp.pdf Comment Period: 11/28/2014 - 12/23/2014 Public Hearing: N/A	Notice of Preparation	County of Los Angeles	SCAQMD staff commented 12/5/2014
Waste and Water-related **SBC141128-19** Fontana Water Tanks	The proposed project consists of the construction of two water reservoirs and a new building to house the existing booster pumps. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopfontanawtr.pdf Comment Period: 11/28/2014 - 12/17/2014 Public Hearing: N/A	Notice of Preparation	City of Fontana	SCAQMD staff commented 12/5/2014
Utilities **LAC141120-06** ENV-2014-3328/ 9870 N. Glenoaks Bl.; Sun Valley; La Tuna Canyon	The proposed project consists of a Conditional Use permit for the installation, use, and maintenance of an unmanned wireless telecommunication facility consisting of a 58-foot-high monopole, with sixteen eight-foot panel antennas. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20143328.pdf Comment Period: 11/20/2014 - 12/10/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/4/2014

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ONGOING ACTIVE PROJECTS FOR WHICH SCAQMD HAS OR IS CONTINUING TO CONDUCT A CEQA REVIEW

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
Utilities **LAC141120-07** ENV-2014-3353/ 2328 W. Temple St. and 261 N. Rosemont Ave.; Westlake	The proposed project consists of a Conditional Use Permit to allow the installation, use, and maintenance of an unmanned wireless telecommunications facility that includes 12 eight-foot high panel antennas, 12 remote radio units, and four ray caps on the roof of an existing four-story apartment complex. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20143353.pdf Comment Period: 11/20/2014 - 12/10/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/4/2014
Utilities **LAC141120-11** ENV-2014-2257/ 14385 W. Polk St.; Sylmar	The proposed project consists of a Conditional Use permit to allow the construction and installation of a wireless telecommunications facility on a rooftop of an existing building. The project consists of 12 antennas all to be screened by a wall and located on the roof of the existing building. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20142257.pdf Comment Period: 11/20/2014 - 12/10/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/4/2014
Utilities **LAC141120-12** ENV-2014-2749/ 1616 E. 24th St.; Southeast Los Angeles	The proposed project consists of a Conditional Use permit to allow the construction and installation of an unmanned wireless telecommunications facility consisting of 12 panel antennas, 12 remote radio units, two raycaps, one microwave antenna on a new monopine with the associated equipment, and a standby generator. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20142749.pdf Comment Period: 11/20/2014 - 12/10/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/4/2014
Utilities **LAC141120-13** ENV-2014-1948/ 211, 215, 217, 221, 223, 225, 227, 231, 233, 235, 237, 239, 241 N. Vermont Ave.; Wilshire	The proposed project consists of demolishing an existing commercial and residential building that consists of 137,201 square feet of floor area with 100 residential apartment units, of which 99 units are restricted affordable, and one manager's unit. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndvermont.pdf Comment Period: 11/20/2014 - 12/22/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/3/2014
Utilities **LAC141127-01** ENV-2014-2549/ 3414 W. Vernon Ave.; West Adams-Baldwin Hills Leimert	The proposed project consists of permitting the installation, use, and maintenance of a new unmanned wireless telecommunications facility comprised of 16 panel antennas, 12 remote radio units, four tower-mounted amplifiers, 10 raycaps, two parabolic antennas, four GPS antennas, a backup power generator, and supportive equipment cabinets to be located on the rooftop of an existing building. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20142549.pdf Comment Period: 11/27/2014 - 12/17/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/5/2014

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Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency
** Comment status is current as of Friday, January 23, 2015

ATTACHMENT B
ONGOING ACTIVE PROJECTS FOR WHICH SCAQMD HAS OR IS CONTINUING TO CONDUCT A CEQA REVIEW

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
Utilities **LAC141127-02** ENV-2014-2595/ 2600 S. Motor Ave.; West Los Angeles	The proposed project consists of permitting the installation, use and maintenance of a new unmanned wireless telecommunications facility consisting of a faux eucalyptus tree comprised of 12 panel antennas, four GPS antennas, and one microwave dish, with supportive equipment cabinets and backup power generator to be located at ground level and screened by an eight-foot tall solid masonry wall. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20142595.pdf Comment Period: 11/27/2014 - 12/17/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/5/2014
Utilities **LAC141127-03** ENV-2014-2604/ 2903 W. Southwest Dr.; West Adams-Baldwin Hills-Leimert	The proposed project consists of permitting the installation, use and maintenance of a new unmanned wireless telecommunications facility consisting of a 45-foot tall monopalm with 12 panel antennas, nine remote radio units, two GPS antennas, three tower-mounted amplifiers, one raycap, with supportive equipment cabinets and a backup power generator located at ground level to be screened by a masonry wall. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20142604.pdf Comment Period: 11/27/2014 - 12/17/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/5/2014
Utilities **LAC141127-04** ENV-2014-2661/ 2314 W. Slauson Ave.; West Adams-Baldwin Hills-Leimert	The proposed project consists of permitting the installation, use and maintenance of an unmanned wireless telecommunications facility comprised of a freestanding 55-foot-tall monopine consisting of 12 panel antennas, six remote radio units, two raycaps, a four-foot-radius microwave antenna, five equipment cabinets and a 10 kilowatt backup power generator at ground level. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20142661.pdf Comment Period: 11/27/2014 - 12/17/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/5/2014
Utilities **LAC141127-05** ENV-2014-2667/ 5514 W. Centinela Ave.; Westchester-Playa Del Rey	The proposed project consists of permitting the installation, use, and maintenance of an unmanned wireless telecommunications facility consisting of a freestanding 70-foot tall monopine with 24 panel antennas in three sectors, 12 remote radio units, 12 tower mounted amplifiers, three raycaps, four GPS antennas, with five equipment cabinets and a backup power generator to be located at ground level and screened with a masonry wall. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20142667.pdf Comment Period: 11/27/2014 - 12/17/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/5/2014

- Project has potential environmental justice concerns due to the nature and/or location of the project.
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** Comment status is current as of Friday, January 23, 2015

ATTACHMENT B
ONGOING ACTIVE PROJECTS FOR WHICH SCAQMD HAS OR IS CONTINUING TO CONDUCT A CEQA REVIEW

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
Utilities **LAC141127-10** ENV-2014-2065/ 6817 N. Lankershim Bl.; North Hollywood-Valley Village	The proposed project consists of a Conditional Use Permit to allow the construction and installation of a wireless telecommunications facility consisting of 12 panel antennas, one megawatt antenna and supporting equipment on an existing monopine, five outdoor equipment cabinets, backup generator and batteries in a proposed wrought iron fence equipment enclosure. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20142065.pdf Comment Period: 11/27/2014 - 12/17/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/5/2014
Utilities **LAC141127-11** ENV-2014-2359/ 1560 S. Western Ave.; South Los Angeles	The proposed project consists of a Conditional Use Permit to allow the construction, use and maintenance of a of an unmanned wireless telecommunications facility consisting of four sectors of four antennas located on the roof of a building behind rooftop screening. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20142359.pdf Comment Period: 11/27/2014 - 12/17/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/5/2014
Utilities **LAC141127-12** ENV-2014-2772/ 6801 S. Park Terr.; Westchester-Playa Del Rey	The proposed project consists of a permit to construct an unmanned wireless telecommunications facility on an 80-foot-tall existing commercial building, consisting of placing 12 panel antennas behind rooftop screening, screening five outdoor equipment cabinets on the rooftop and addition of three GPS antennas and one generator. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/mndcellenv20142772.pdf Comment Period: 11/27/2014 - 12/17/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/5/2014
Transportation **ORC141118-02** Fullerton Road Corridor Improvements Project	The proposed project consists of a roadway widening along 0.45 miles of Fullerton Road with the City of Industry jurisdictional boundary (Fullerton Road/State Route 60) and ending at Camino Bello in the unincorporated County area of Rowland Heights. The project would add a third lane in each direction along Fullerton Road and include the future accommodation of a Class II bicycle lane from Colima Road to Camino Bello. At Fullerton Road and State Route 60, the existing eastbound off-ramp would be reconstructed as part of the widening project to accommodate an additional right-turn lane. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/deirfullertonrd.pdf Comment Period: 11/18/2014 - 12/31/2014 Public Hearing: N/A	Draft Environmental Impact Report	County of Los Angeles	SCAQMD staff commented 12/24/2014
General Land Use (residential, etc.) **LAC141106-05** ENV-2014-2838/ 22720 W. Vanowen St; Canoga Park-Winnetka-Woodland Hills-West Hills	The proposed project consists of demolishing an existing single-family dwelling, detached garage, and barn; and the construction of 20 single-family dwellings on 20 individual lots. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/ndvanowen.pdf Comment Period: 11/6/2014 - 12/8/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/2/2014

- Project has potential environmental justice concerns due to the nature and/or location of the project.
Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency
** Comment status is current as of Friday, January 23, 2015

ATTACHMENT B
ONGOING ACTIVE PROJECTS FOR WHICH SCAQMD HAS OR IS CONTINUING TO CONDUCT A CEQA REVIEW

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**
General Land Use (residential, etc.) **LAC141120-05** 7107 Hollywood Boulevard Project	The proposed project consists of developing up to 410 multi-family residential units and approximately 10,000 square feet of community-serving retail and restaurant uses on an approximately 2.0-acre site within the Hollywood community. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nop7107hollywood.pdf Comment Period: 11/20/2014 - 12/22/2014 Public Hearing: N/A	Notice of Preparation	City of Los Angeles	SCAQMD staff commented 12/4/2014
General Land Use (residential, etc.) **LAC141127-08** ENV-2014-1880/255-295 W. 8th St.; San Pedro	The proposed project consists of a re-subdivision of seven vacant lots into 24 small lots for the construction, use, and maintenance of a single-family dwelling on each lot. The project will include a haul route for the export of 11,900 cubic yards. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/dmnd8thsts.pdf Comment Period: 11/27/2014 - 12/17/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 12/12/2014
General Land Use (residential, etc.) **LAC141128-08** Canyon Park Homes	The proposed project consists of a residential development on privately owned land consisting of 242 single-family dwellings, three private parks, and associated infrastructure on an approximately 78.04-acre site. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopcanyonpark.pdf Comment Period: 11/28/2014 - 12/22/2014 Public Hearing: N/A	Notice of Preparation	City of Los Angeles	SCAQMD staff commented 12/5/2014
General Land Use (residential, etc.) **LAC141128-10** 3931 S. Flower Drive Demolition Project	The proposed project consists of demolishing a multi-family residential building. No development is proposed following demolition and the project site would remain vacant. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nopflower.pdf Comment Period: 11/28/2014 - 12/22/2014 Public Hearing: N/A	Notice of Preparation	City of Los Angeles	SCAQMD staff commented 12/5/2014
General Land Use (residential, etc.) **LAC141128-17** 500 Broadway Mixed-Use Housing Project	The proposed project consists of demolishing an existing one-story commercial building and a 92-space surface parking lot on two contiguous parcels totaling approximately 67,500 square feet of land area and the construction of 336,630 square feet of mixed-use development in an 84-foot high building. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/december/nop500broad.pdf Comment Period: 11/28/2014 - 12/22/2014 Public Hearing: N/A	Notice of Preparation	City of Santa Monica	SCAQMD staff commented 12/5/2014

- Project has potential environmental justice concerns due to the nature and/or location of the project.
Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency
** Comment status is current as of Friday, January 23, 2015

ATTACHMENT B
ONGOING ACTIVE PROJECTS FOR WHICH SCAQMD HAS OR IS CONTINUING TO CONDUCT A CEQA REVIEW

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS**

TOTAL NUMBER OF REQUESTS TO SCAQMD FOR DOCUMENT REVIEW THIS REPORTING PERIOD:	**109**
TOTAL NUMBER OF COMMENT LETTERS SENT OUT THIS REPORTING PERIOD:	**50**
TOTAL NUMBER OF DOCUMENTS REVIEWED, BUT NO COMMENTS WERE SENT:	**12**
TOTAL NUMBER OF DOCUMENTS CURRENTLY UNDER REVIEW:	**27**
TOTAL NUMBER OF DOCUMENTS THAT DID NOT REQUIRE COMMENTS:	**2**
TOTAL NUMBER OF DOCUMENTS THAT WERE NOT REVIEWED:	**1**
TOTAL NUMBER OF DOCUMENTS THAT WERE SCREENED WITHOUT ADDITIONAL REVIEW:	**47**

- Project has potential environmental justice concerns due to the nature and/or location of the project.
Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency
** Comment status is current as of Friday, January 23, 2015

ATTACHMENT C
ACTIVE SCAQMD LEAD AGENCY PROJECTS
THROUGH December 31, 2014

PROJECT DESCRIPTION	PROPONENT	TYPE OF DOCUMENT	STATUS	CONSULTANT
The Phillips 66 (formerly ConocoPhillips) Los Angeles Refinery Ultra Low Sulfur Diesel project was originally proposed to comply with federal, state and SCAQMD requirements to limit the sulfur content of diesel fuels. Litigation against the CEQA document was filed. Ultimately, the California Supreme Court concluded that the SCAQMD had used an inappropriate baseline and directed the SCAQMD to prepare an EIR, even though the project has been built and has been in operation since 2006. The purpose of this CEQA document is to comply with the Supreme Court's direction to prepare an EIR.	Phillips 66 (formerly ConocoPhillips), Los Angeles Refinery	Environmental Impact Report	The Notice of Preparation was circulated for a 30-day public comment period on March 26, 2012. The comment period ended on April 26, 2012. The consultant submitted the administrative Draft EIR to SCAQMD in late July 2013. SCAQMD reviewed the Draft EIR and released for a 45-day public review and comment period on September 30, 2014 ending November 13, 2014. Two comment letters were received and responses to comments are being prepared.	Environmental Audit, Inc.
The Phillips 66 Los Angeles Refinery operators are proposing to install one new 615,000-barrel crude oil storage tank with a geodesic dome to accommodate larger marine vessels delivering crude oil. The proposed project also includes increasing the throughput (i.e., frequency of filling and emptying tank) on two existing tanks and adding geodesic domes to these tanks, installing one new 14,000-barrel water draw surge tank and installing one new electrical power substation.	Phillips 66 Los Angeles Refinery Carson Plant	Negative Declaration	The Draft ND was released for a 30-day public review and comment period beginning on September 10, 2013 and ending on October 9, 2013. Three comment letters were received, and responses to comments were prepared and included in the Final ND, which was certified on December 12, 2014.	Environmental Audit, Inc.
Tesoro Refinery proposes to integrate the Tesoro Wilmington Operations with the Tesoro Carson Operations (former BP Refinery). The proposed project also includes modifications of storage tanks at both facilities, new interconnecting pipelines, and new electrical connections. In addition, Carson's Liquid Gas Rail Unloading facilities will be modified. The proposed project will be designed to comply with the federally mandated Tier 3 gasoline specifications and with State and local regulations mandating emission reductions.	Tesoro Refining and Marketing Company Los Angeles Refinery	EIR	A previous Draft ND was withdrawn in order for this project to be analyzed in a new CEQA document that also addresses the upcoming Tesoro-BP Refinery Integration Project. An NOP-IS has been prepared for the integration project and released for a 30-day public review and comment period on September 10, 2014 closing on October 10, 2014. 86 comment letters were received, and responses are being prepared.	Environmental Audit, Inc.
Operators of the KinderMorgan Lomita Terminal are proposing to deliver crude oil by expanding their rail facility.	KinderMorgan Lomita Terminal	To Be Determined	The consultants are preparing emission estimates to determine the type of CEQA document to be prepared.	SABS Consulting and TRC
Operators of the Petro Diamond Marine Terminal are proposing to increase the number of ship calls delivering ethanol.	Petro Diamond	To Be Determined	The consultant has prepared a Draft Negative Declaration. SCAQMD staff is currently reviewing the Draft Negative Declaration to determine if it is the appropriate type of CEQA document for the project.	SABS Consulting

A shaded row indicates a new project.

ATTACHMENT C
ACTIVE SCAQMD LEAD AGENCY PROJECTS
THROUGH December 31, 2014

PROJECT DESCRIPTION	PROPONENT	TYPE OF DOCUMENT	STATUS	CONSULTANT
Quemetco is proposing an increase in daily furnace feed rate.	Quemetco	To Be Determined	Initial Study under review by SCAQMD staff.	Trinity Consultants
Chevron is proposing modifications to its Product Reliability and Optimization (PRO) Project and has applied for a change of permit conditions to reduce NOx emissions and fired duty operating conditions of the Tail Gas Unit.	Chevron	Addendum	Under staff review and edits provided to the consultant. Chevron currently conducting BACT review for equipment.	Environmental Audit, Inc.
Signal Hill Petroleum is proposing to upgrade the existing natural gas processing plant and enhance their vapor recovery system. No new combustion equipment will be installed.	Signal Hill Petroleum Gas Plant	Subsequent Mitigated Negative Declaration	The SMND was released for a 35-day public comment and review period on November 26, 2014 ending December 30, 2014. No comment letters were received.	RBF Consulting
Exide Technologies is proposing a project to reduce toxic emissions of arsenic, benzene and 1,3-butadiene to comply with SCAQMD Rules and Regulations.	Exide Technologies	Mitigated Negative Declaration	SCAQMD Staff has prepared a Draft MND that was released for a 30-day public review and comment period on October 16, 2014 ending on November 14, 2014. No comment letters were received. The final MND were certified on December 5, 2014.	Environ
Breitburn Operating LP is proposing to upgrade their fluid handling systems to facilitate an increase in the amount of produced water that can be treated at the site in Sante Fe Springs.	Breitburn Operating LP	Environmental Impact Report	The NOP/IS was released on December 4, 2014 for a 30-day public review and comment period.	Environ

A shaded row indicates a new project.

Back to Agenda

BOARD MEETING DATE: February 6, 2015 AGENDA NO. 11

REPORT: Rule and Control Measure Forecast

SYNOPSIS: This report highlights SCAQMD rulemaking activities and public workshops potentially scheduled for the year 2015.

COMMITTEE: No Committee Review

RECOMMENDED ACTION:
Receive and file.

Barry R. Wallerstein, D.Env.
Executive Officer

EC:PF:cg

415	Odors from Animal Rendering
Proposed Rule 415 is moved from April to May to allow additional time to work with stakeholders on the rule proposal.	
416	Odors from Kitchen Grease Processing
Proposed Rule 416 is moved from April to May to allow additional time to work with stakeholders on the rule proposal.	
Reg. IX Reg. X	Standards of Performance for New Stationary Sources National Emission Standards for Hazardous Air Pollutants
Amendments to Regulations IX and X are moved from March to April to allow staff additional time to reflect all amendments to 40 CFR Parts 60 and 61 by U.S. EPA through 2014.	
1304.2	Greenfield or Existing Electrical Generating Facility Fee for Use of Offsets for Load Serving Entities
Proposed Rule 1304.2 is moved from March to September to allow staff additional time to work with stakeholders and finalize the environmental documents necessary for the rule.	

1304.3	Greenfield or Existing Electrical Generating Facility Fee for Use of Offsets for Municipalities
Proposed Rule 1304.3 is moved from March to September to allow staff additional time to work with stakeholders and finalize the environmental documents necessary for the rule.	
1401	New Source Review of Toxic Air Contaminants
Rule 1401 is moved from April to May to allow staff time to complete analysis and additional time to work with stakeholders.	
1420.2	Emissions Standard for Lead from Medium Sources
Proposed Rule 1420.2 is moved from March to June to allow additional time to work with stakeholders.	

2015 MASTER CALENDAR

Below is a list of all rulemaking activity scheduled for the year 2015. The last four columns refer to the type of rule adoption or amendment. A more detailed description of the proposed rule adoption or amendment is located in the Attachments (A through D) under the type of rule adoption or amendment (i.e. AQMP, Toxics, Other and Climate Change).

**An asterisk indicates that the rulemaking is a potentially significant hearing.*
+This proposed rule will reduce criteria air contaminants and assist toward attainment of ambient air quality standards.
[1]Subject to Board approval
California Environmental Quality Act shall be referred to as "CEQA."
Socioeconomic Analysis shall be referred to as "Socio."

2015

March		**AQMP**	**Toxics**	**Other**	**Climate Change**
1420.1	Emission Standards for Lead and Other Toxic Air Contaminants from Large Lead-Acid Battery Recycling Facilities		√		
April					
Reg. IX[1]	Standards of Performance for New Stationary Sources			√	
Reg. X[1]	National Emission Standards for Hazardous Air Pollutants			√	
1148.1	Oil and Gas Production Wells			√	
2202	On-Road Motor Vehicle Mitigation Options			√	
4001	Backstop to Ensure AQMP Emission Reduction Targets Are Met at Commercial Marine Ports (IND-01)	√			
May					
219	Equipment Not Requiring a Written Permit Pursuant to Regulation II			√	
Reg. III	Fees			√	
415[1]	Odors from Animal Rendering			√	
416[1]	Odors from Kitchen Grease Processing			√	

2015 MASTER CALENDAR (continued)

2015

May	(continued)	AQMP	Toxics	Other	Climate Change
1156	Further Reductions of Particulate Emissions from Cement Manufacturing Facilities		√		
1166	Volatile Organic Compound Emissions From Decontamination of Soil			√	
1188	VOC Reductions from Vacuum Trucks (FUG-01)	√			
1401[1]	New Source Review of Toxic Air Contaminants		√		
Reg. XX	Regional Clean Air Incentives Market (RECLAIM) (CMB-01)	√			
June					
1148.2	Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers		√	√	
1420	Emissions Standard for Lead		√		
1420.2[1]	Emissions Standard for Lead from Metal Melting Operations		√		
2301	Control of Emissions from New or Redevelopment Projects (EGM-01)	√			
July					
1123	Refinery Process Turnarounds (MCS-03)	√			
1171	Solvent Cleaning Operations (CTS-02)	√			
1430.1	Control of Toxic Air Contaminants from Grinding Operations at Forging Facilities		√		
September					
1106	Marine Coating Operations			√	
1106.1	Pleasure Craft Coating Operations			√	

2015 MASTER CALENDAR (continued)

2015

September	(continued)	AQMP	Toxics	Other	Climate Change
1304.2[1]	Greenfield or Existing Electrical Generating Facility Fee for Use of Offsets for Load Serving Entities			√	
1304.3[1]	Greenfield or Existing Electrical Generating Facility Fee for Use of Offsets for Municipalities			√	
October					
1110.2	Emissions from Gaseous and Liquid-Fueled Engines			√	
1161	VOC Reductions from Mold Release Agents (CTS-03)	√			
November					
1113	Architectural Coatings (CTS-01)	√			
1177	Liquefied Petroleum Gas Transfer and Dispensing (FUG-02)	√			
1402	Control of Toxic Air Contaminants from Existing Sources		√		
1450	Control of Methylene Chloride Emissions		√		
December					
1136	Wood Products Coatings (CTS-02)			√	
1430	Control of Toxic Air Contaminants from Metal Forging, Shredding, Grinding and Other Metal Processing Operations		√		

2015 TO-BE DETERMINED

TBD		AQMP	Toxics	Other	Climate Change
219	Equipment Not Requiring a Written Permit Pursuant to Regulation II			√	

2015 MASTER CALENDAR (continued)

2015 TO-BE DETERMINED

TBD	(continued)	AQMP	Toxics	Other	Climate Change
222	Filing Requirements for Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation I			√	
224	Incentives for Super-Compliant Technologies			√	
1107	Coating of Metal Parts and Products (CTS-02)			√	
1118	Control of Emissions from Refinery Flares			√	√
1147	NOx Reductions from Miscellaneous Sources			√	
1148.2	Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers		√	√	
1168	Adhesive and Sealant Applications (CTS-02)	√			
1190 Series	Fleet Vehicle Requirements			√	
Reg. XIII	New Source Review			√	
1403	Asbestos Emissions from Demolition/Renovation Activities		√		
1411	Recovery of Recycling of Refrigerants from Motor Vehicle Air Conditioners		√		
1902	Transportation Conformity – Preamble			√	
2511	Credit Generation Program for Locomotive Head End Power Unit Engines			√	
2512	Credit Generation Program for Ocean-Going Vessels at Berth			√	
Reg. XXVII	Climate Change				√

2015 MASTER CALENDAR (continued)

2015 TO-BE DETERMINED

TBD	(continued)	AQMP	Toxics	Other	Climate Change
Reg. IV, IX, X, XI, XIV, XX XXX and XXXV Rules	Various rule amendments may be needed to meet the requirements of state and federal laws, implement OEHHA revised risk assessment guidance, address variance issues/ technology-forcing limits, to abate a substantial endangerment to public health or welfare, or to seek additional reductions to meet the SIP short-term measure commitment. The associated rule development or amendments include, but are not limited to, SCAQMD existing rules listed in Table 1 of the December 5, 2014 Rule and Control Measure Forecast and new or amended rules to implement the 2012 AQMP measures in Table 2 of the December 5, 2014 Rule and Control Measure Forecast. The CCP has been updated to include new measures to address toxic emissions in the basin. The CCP includes a variety of measures that will reduce exposure to air toxics from stationary, mobile, and area sources (Table 3 of the December 5, 2014 Rule and Control Measure Forecast). Rule amendments may include updates to provide consistency with CARB Statewide Air Toxic Control Measures.	√	√	√	√
---	Mobile Source Measures	√	√		
---	SIP Implementation	√			

ATTACHMENT A

AQMP Rule Activity Schedule

This attachment lists those control measures that are being developed into rules or rule amendments for Governing Board consideration that are designed to implement the amendments to the 2012 Air Quality Management Plan.

2015

April	
4001	**Backstop to Ensure AQMP Emission Reduction Targets Are Met at Commercial Marine Ports (IND-01)** *[Projected Emission Reduction: TBD]* If triggered, the proposed rule will address cost-effective NOx, SOx, and PM2.5 emission reduction strategies from port-related sources to ensure emission reductions claimed or emission targets assumed in the 2012 AQMP for the 24-hour PM2.5 standard are maintained. *Randall Pasek 909.396.2251 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
May	
1188	**VOC Reductions from Vacuum Trucks (FUG-01)** *[Projected Emission Reduction: TBD]* The proposed rule will establish VOC emission standards and other requirements associated with the operation of vacuum trucks not covered by Rule 1149 – Storage Tank and Pipeline Cleaning and Degassing. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
Reg. XX	**Regional Clean Air Incentives Market (RECLAIM) (CMB-01)** *[Projected Emission Reduction: 3-5 TPD]* Proposed amendments to Regulation XX will seek to implement a minimum contingency measure CMB-01 of the 2012 AQMP and possibly Phase II of the control measure if the technology assessment can be completed within the allotted time for this rulemaking. *Joe Cassmassi 909.396.3155 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
June	
2301	**Control of Emissions from New or Redevelopment Projects (EGM-01)** *[Projected Emission Reduction: Committed to reduce 0.5 tons per day of VOC, 0.8 tons per day of NOx, and 0.5 tons per day of PM2.5 in 2023.]* The proposed rule will implement AQMP Control Measure EGM-01 – Emission Reductions from New or Redevelopment Projects. Proposed Rule 2301 will consider the co-benefits of VOC, NOx, and PM 2.5 emission reductions from the 2012 Regional Transportation Plan/Sustainable Communities Strategy and San Joaquin Valley Air Pollution Control District's Rule 9510 to meet the "all feasible measure" requirement. *Carol Gomez 909.396.3264 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*

ATTACHMENT A

AQMP Rule Activity Schedule (continued)

2015

July	
1123	**Refinery Process Turnarounds (MCS-03)** *[Projected Emission Reduction: N/A]* Proposed amendments, if needed, will implement Control Measure MSC-03 of the 2007 AQMP by establishing procedures that better quantify emission impacts from start-up, shutdown or turnaround activities. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1171	**Solvent Cleaning Operations (CTS-02)** *[Projected Emission Reduction: Some VOC]* The proposed amendments will review existing exemptions and include clarifications that may arise due to compliance verification activities or manufacturer and public input, including the sales prohibition clause. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
October	
1161	**VOC Reductions from Mold Release Agents (CTS-03)** *[Projected Emission Reduction: TBD]* The proposed rule will establish requirements for mold release products used in composite, fiberglass, metal and plastic manufacturing, and concrete stamping operations. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
November	
1113	**Architectural Coatings (CTS-01)** *[Projected Emission Reduction: N/A]* Potential amendments may include a backstop provision to address additional potential VOC emission reductions from the small container exemption, high volume categories, and increased fees in Rule 314 – Fees for Architectural Coatings. Additional clarifications will also be considered to address ongoing compliance issues. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1177	**Liquefied Petroleum Gas Transfer and Dispensing (FUG-02)** *[Projected Emission Reduction: N/A]* Potential amendments may be proposed to include additional sources of emissions from the dispensing and transfer of LPG. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*

ATTACHMENT A

AQMP Rule Activity Schedule (continued)

2015

To-Be Determined	
1168	**Adhesive and Sealant Applications (CTS-02)** *[Projected Emission Reduction: N/A]* Amendments to Rule 1168 will partially implement CTS-02 and reflect improvements in adhesive and sealants technology, as well as remove outdated provisions and include minor clarifications. *Naveen Berry 909.396.236 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
Reg. IV, IX, X, XI, XIV, XIV, XX, XXX AND XXXV Rules	Various rule amendments may be needed to meet the requirements of state and federal laws, implement OEHHA revised risk assessment guidance, address variance issues/ technology-forcing limits, to abate a substantial endangerment to public health or welfare, or to seek additional reductions to meet the SIP short-term measure commitments and/or long-term emission reduction commitments. The associated rule development or amendments include, but are not limited to, SCAQMD existing rules listed in Table 1 of the December 5, 2014 Rule and Control Measure Forecast and new or amended rules to implement the 2012 AQMP measures in Table 2 of the December 5, 2014 Rule and Control Measure Forecast.
---	**Mobile Source Measures** *[Projected Emission Reduction: TBD]* The District may adopt measures to limit emissions from mobile sources, both on-road and off-road (nonroad) sources, consistent with the Board's direction to counsel at the October 2014 meeting to explore the District's regulatory authority over mobile sources. These measures may include but are not limited to, transportation control measures, operational limits, fleet rules, credit generation rules, and indirect source rules, such as an indirect source rule for railyards and/or other sources which attract mobile sources. *Henry Hogo 909.396.3184 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
---	**SIP Implementation** *[Projected Emission Reduction: TBD]* The District may adopt additional measures to carry out the State Implementation Plan for PM2.5 or ozone, or other pollutants if required, as deemed necessary to meet commitments and federal requirements. *Philip Fine 909.396.2239 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*

ATTACHMENT B

Toxics Rule Activity Schedule

This attachment lists those rules or rule amendments for Governing Board consideration that are designed to implement the Air Toxics Control Plan.

2015

March	
1420.1	**Emission Standards for Lead and Other Toxic Air Contaminants from Large Lead-Acid Battery Recycling Facilities** *[Projected Emission Reduction: TBD]* The proposed amendment will reduce arsenic, benzene, and 1,3-butadiene emissions from large lead-acid battery recycling facilities. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
May	
1156	**Further Reductions of Particulate Emissions from Cement Manufacturing Facilities** *[Projected Emission Reduction: N/A]* As part of the 2009 amendments to Rule 1156, cement manufacturing facilities were required to establish and maintain a monitoring network to ensure that the surrounding areas were not exposed to unhealthful levels of hexavalent chromium emanating from the facilities. Since establishing the monitoring networks, no exceedances of the standard established in the amended rule has occurred. Pursuant to the adoption resolution, the proposed rule amendments will address the conditions by which the existing monitoring requirements could be reduced, particularly as they pertain to partial or full facility shutdown and any change in ownership and land use. *Philip Fine 909.396.2239 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1401[1]	**New Source Review of Toxic Air Contaminants** *[Projected Emission Reduction: TBD]* The Office of Environmental Health Hazard Assessment (OEHHA) is updating its Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. The proposed amendment will address revisions to OEHHA's updated guidance. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
June	
1148.2	**Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers** *[Projected Emission Reduction: N/A]* Amendments to Rule 1148.2 may be needed to extend the implementation of requirements to submit emissions reports and other necessary changes to be consistent with SB 4. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*

ATTACHMENT B

Toxics Rule Activity Schedule (continued)

2015

June	(continued)
1420	**Emissions Standard for Lead** *[Projected Emission Reduction: TBD]* In October 2008, U.S. EPA lowered the National Ambient Air Quality Standard (NAAQS) for lead from 1.5 to 0.15 ug/m3. Proposed Rule 1420 will establish requirements for smaller lead emitting sources that are not covered under Rules 1420.1 and Rule 1420.2 to ensure compliance with the lead NAAQS. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1420.2[1]	**Emissions Standard for Lead from Metal Melting Operations** *[Projected Emission Reduction: TBD]* In October 2008, U.S. EPA lowered the National Ambient Air Quality Standard (NAAQS) for lead from 1.5 to 0.15 ug/m3. Proposed Rule 1420.2 will establish requirements for medium lead emitting sources to ensure compliance with the lead NAAQS. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
July	
1430.1	**Control of Toxic Air Contaminants from Grinding Operations at Forging Facilities** *[Projected Emission Reduction: TBD]* Proposed Rule 1430.1 will establish emission reduction requirements to control toxic emissions from grinding operations at forging facilities. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
November	
1402	**Control of Toxic Air Contaminants from Existing Sources** *[Projected Emission Reduction: TBD]* Amendments to Rule 1402 will address new or revised toxic air contaminants that have been approved by OEHHA. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1450	**Control of Methylene Chloride Emissions** *[Projected Emission Reduction: N/A]* Proposed Rule 1450 will establish requirements to control methylene chloride from furniture stripping operations and other sources. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
December	
1430	**Control of Toxic Air Contaminants from Metal Forging, Shredding, Grinding and Other Metal Processing Operations** *[Projected Emission Reduction: TBD]* Proposed Rule 1430 will establish emission reduction requirements to control toxic emissions from grinding operations. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*

ATTACHMENT B

Toxics Rule Activity Schedule (continued)

To-Be Determined 2015

To-Be Determined	
1148.2	**Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers** *[Projected Emission Reduction: N/A]* Revisions to Rule 1148.2 may be needed based on information collected through implementation of Rule 1148.2. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1403	**Asbestos Emissions from Demolition/Renovation Activities** *[Projected Emission Reduction: N/A]* Amendments to Rule 1403 will include specific requirements when conducting asbestos emitting demolition/renovation activities at schools, daycares, and possibly establishments that have sensitive populations. Amendments may include other provisions to improve the implementation of the rule. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1411	**Recovery of Recycling of Refrigerants from Motor Vehicle Air Conditioners** *[Projected Emission Reduction: TBD]* The proposed amendments to Rule 1411 will align with existing Clean Air Act requirements to minimize the release of refrigerants during the servicing of motor vehicle air conditioning, incorporate other clarifications and enhance enforceability. *Philip Fine 909.396.2239 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
Reg. IV, IX, X, XI, XIV, XIV, XX, XXX AND XXXV Rules	The Clean Communities Plan has been updated to include new measures to address toxic emissions in the basin. The CCP includes a variety of measures that will reduce exposure to air toxics from stationary, mobile, and area sources (Table 3 of the December 5, 2014 Rule and Control Measure Forecast). Rule amendments may include updates to provide consistency with CARB Statewide Air Toxic Control Measures.
---	**Mobile Source Measures** *[Projected Emission Reduction: TBD]* The District may adopt measures to limit emissions from mobile sources, both on-road and off-road (nonroad) sources, consistent with the Board's direction to counsel at the October 2014 meeting to explore the District's regulatory authority over mobile sources. These measures may include but are not limited to, transportation control measures, operational limits, fleet rules, credit generation rules, and indirect source rules, such as an indirect source rule for railyards and/or other sources which attract mobile sources. *Henry Hogo 909.396.3184 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*

ATTACHMENT C

Other Rule Activity Schedule

This attachment lists those rules or rule amendments for the Governing Board consideration that are designed to improve rule enforceability, SIP corrections, or implementing state or federal regulations.

2015

April	
Reg. IX[1] Reg. X[1]	**Standards of Performance for New Stationary Sources (NSPS)** **National Emission Standards for Hazardous Air Pollutants (NESHAPS)** *[Projected Emission Reduction: N/A]* Regulation IX - Standards of Performance for New Stationary Sources and Regulation X - National Emission Standards for Hazardous Air Pollutants, incorporate by reference the corresponding federal requirements. Amendments are being proposed to incorporate the latest federal revisions. *Philip Fine 909.396.2239 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1148.1	**Oil and Gas Production Wells** *[Projected Emission Reduction: N/A]* Amendments may be necessary to improve rule effectiveness in reducing emissions from production wells and associated equipment and improving housekeeping activities to minimize potential nuisance. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
2202	**On-Road Motor Vehicle Mitigation Options** *[Projected Emission Reduction: N/A]* The Employee Commute Reduction Program (ECRP) Guidelines to Rule 2202 will be amended to streamline the annual reporting process, and to add clarification to specific guideline sections as requested by the regulated community. *Carol Gomez 909.396.3264 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
May	
219	**Equipment Not Requiring a Written Permit Pursuant to Regulation II** *[Projected Emission Reduction: N/A]* Amendments to Rule 219 may be proposed to exclude equipment with de minimis emissions from the requirement to obtain written permits and clarify provisions pertaining to super-compliant technologies. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*

ATTACHMENT C

Other Rule Activity Schedule (continued)

2015

May	(continued)
Reg. III	**Fees** *[Projected Emission Reduction: N/A]* Regulation III is being amended with a primary goal to increase fees, at a minimum by the Consumer Price Index. Other minor amendments may also be proposed to correct typos, eliminate out-of-date references, and improve consistency and clarity. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
415[1]	**Odors from Animal Rendering** *[Projected Emission Reduction: TBD]* Proposed Rule 415 will provide protection to the public from odors created during animal rendering operations. The proposed rule will incorporate a preventative approach to odors by establishing Best Management Practices (BMP) and will consider enclosures for operations and processes that generate odors, such as receiving, cooking, processing of oils, tallow and meat, and from wastewater treatment. The proposed rule will also examine requirements for an Odor Mitigation Plan for continuing odor issues at facilities impacted by the rule. *Philip Fine 909.396.2239 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
416[1]	**Odors from Kitchen Grease Processing** *[Projected Emission Reduction: TBD]* Proposed Rule 416 will provide protection to the public from odors created during kitchen grease processing operations. The proposed rule will establish Best Management Practices (BMP) to address odors created during delivery and processing of trap grease to affected facilities. In addition, the proposed rule will examine enclosure for wastewater treatment operations and filter cake storage. The proposed rule will also examine requirements for an Odor Mitigation Plan for continuing odor issues at facilities impacted by the rule. *Philip Fine 909.396.2239 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1166	**Volatile Organic Compound Emissions from Decontamination of Soil** *[Projected Emission Reduction: TBD]* Amendments to Rule 1166 will expand the applicability to decontamination of soils containing toxic metals. The proposed amended rule would establish additional requirements to control emissions from activities containing storing, handling, and transporting soil contaminated with toxic metals. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*

ATTACHMENT C

Other Rule Activity Schedule (continued)

2015

June	
1148.2	**Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers** *[Projected Emission Reduction: N/A]* Amendments to Rule 1148.2 may be needed to extend the implementation of requirements to submit emissions reports and other necessary changes to be consistent with SB 4. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
September	
1106 1106.1	**Marine Coating Operations** **Pleasure Craft Coating Operations** *[Projected Emission Reduction: N/A]* The proposed amendments will include any clarifications that may arise due to the compliance verification activities or manufacturer and public input, including the sales prohibition clause. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1304.2[1]	**Greenfield or Existing Electrical Generating Facility Fee for Use of Offsets for Load Serving Entities** *[Projected Emission Reduction: TBD]* Proposed Rule 1304.2 would provide for new, greenfield or additions at existing electrical generating facilities access to the SCAQMD's internal offset account, subject to qualifying conditions, eligibility, and the payment of a fee to invest in air quality improvement projects consistent with the AQMP. This rule is a companion provision to recently adopted Rule 1304.1 and will provide that new, proposed and other existing electrical generating facilities can compete on a level playing field with existing generating facilities with utility steam boilers, and implement the State's plan to maintain grid reliability. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1304.3[1]	**Greenfield or Existing Electrical Generating Facility Fee for Use of Offsets for Municipalities** *[Projected Emission Reduction: TBD]* Proposed Rule 1304.3 would provide for new, greenfield or additions at existing electrical generating facilities to access the SCAQMD's internal offset account, subject to qualifying conditions, eligibility, and the payment of a fee to invest in air quality improvement projects consistent with the AQMP. This rule is a companion provision to recently adopted Rule 1304.1 and will provide that new, proposed and other existing electrical generating facilities run by local municipalities to meet the reliable electric needs of their customers. ***Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155***

ATTACHMENT C

Other Rule Activity Schedule (continued)

2015

October	
1110.2	**Emissions from Gaseous- and Liquid-Fueled Engines** *[Projected Emission Reduction: N/A]* The proposed amendments to Rule 1110.2 would potentially extend the compliance date for biogas used to fuel power generators at landfills and municipal waste facilities. The amendment would result in a delay in emission reductions. *Joe Cassmassi 909.396.3155 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
December	
1136	**Wood Products Coatings** *[Projected Emission Reduction: TBD* The proposed amendments will include any clarification that may arise due to compliance verification activities or manufacturer and public input, including the sales prohibition clause. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*

To-Be Determined 2015

To-Be Determined	
219	**Equipment Not Requiring a Written Permit Pursuant to Regulation II** *[Projected Emission Reduction: N/A]* Amendments to Rule 219 may be proposed to exclude equipment with de minimis emissions from the requirement to obtain written permits. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
222	**Filing Requirements for Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation I** *[Projected Emission Reduction: N/A]* Amendments for Rule 222 may be proposed to add additional equipment categories to the streamlined filing/registration program of Rule 222. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
224	**Incentives for Super-Compliant Technologies** *[Projected Emission Reduction: TBD]* This proposed rule will outline strategies and requirements to incentivize the development, establishment and use of super-compliant technologies. It can be considered as a part of Rule 219 amendments or proposed as a separate incentive rule. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*

ATTACHMENT C

Other Rule Activity Schedule (continued)

To-Be Determined 2015

To-Be Determined	(continued)
1107	**Coating of Metal Parts and Products** *[Projected Emission Reduction: N/A]* Potential amendments to Rule 1107 would further reduce VOC emissions and improve rule clarity and enforceability. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1118	**Control of Emissions from Refinery Flares** *[Projected Emission Reduction: TBD]* Amendments may be necessary to address results of the additional analysis required by the adopting resolution for the last amendment. Amendments may also be necessary to implement an AB 32 measure. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1147	**NOx Reductions from Miscellaneous Sources** *[Projected Emission Reduction: N/A]* Amendments may be necessary to address findings of ongoing technology assessment. *Joe Cassmassi 909.396.3155 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1148.2	**Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers** *[Projected Emission Reduction: N/A]* Revisions to Rule 1148.2 may be needed based on information collected through implementation of Rule 1148.2. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1190 Series	**Fleet Vehicle Requirements** *[Projected Emission Reduction: TBD]* Amendments to Rule 1190 series fleet rules may be necessary to address remaining outstanding implementation issues and in the event the court's future action requires amendments. In addition, the current fleet rules may be expanded to achieve additional air quality and air toxic benefits. *Dean Saito 909.396.2647 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
Reg. XIII	**New Source Review** *[Projected Emission Reduction: TBD]* Amendments may be necessary to address U.S. EPA comments on SIP approvability issues and/or requirements. Amendments may also be proposed for clarity and improved enforceability. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
1902	**Transportation Conformity** *[Projected Emission Reduction: TBD]* Amendments to Rule 1902 may be necessary to bring the District's Transportation Conformity rule in line with current U.S. EPA requirements. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*

ATTACHMENT C

Other Rule Activity Schedule (continued)

To-Be Determined 2015

To-Be Determined	(continued)
2511	**Credit Generation Program for Locomotive Head End Power Unit Engines** *[Projected Emission Reduction: TBD]* Develop a rule to allow generation of PM mobile source emission reduction credits from Locomotive Head End Power Unit Engines. Credits will be generated by retrofitting engines with PM controls or replacing the engines with new lower-emitting engines. *Randall Pasek 909.396.2251 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
2512	**Credit Generation Program for Ocean-Going Vessels at Berth** *[Projected Emission Reduction: TBD]* Develop a rule to allow generation of PM, NOx and SOx emission reduction credits from ocean-going vessels while at berth. Credits will be generated by controlling the emissions from auxiliary engines and boilers of ships while docked. *Randall Pasek 909.396.2251 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
Reg. IV, IX, X, XI, XIV, XX, XXX AND XXXV Rules	Various rule amendments may be needed to meet the requirements of state and federal laws, implement OEHHA revised risk assessment guidance, address variance issues/ technology-forcing limits, to abate a substantial endangerment to public health or welfare, or to seek additional reductions to meet the SIP short-term measure commitment. The associated rule development or amendments include, but are not limited to, SCAQMD existing rules listed in Table 1 of the December 5, 2014 Rule and Control Measure Forecast and new or amended rules to implement the 2012 AQMP measures in Table 2 of the December 5, 2014 Rule and Control Measure Forecast. The CCP has been updated to include new measures to address toxic emissions in the basin. The CCP includes a variety of measures that will reduce exposure to air toxics from stationary, mobile, and area sources (Table 3 of the December 5, 2014 Rule and Control Measure Forecast). Rule amendments may include updates to provide consistency with CARB Statewide Air Toxic Control Measures.

ATTACHMENT D

Climate Change

This attachments lists rules or rule amendments for Governing Board consideration that are designed to implement SCAQMD's Climate Change Policy or for consistency with state or federal rules.

To-Be Determined 2015

To-Be Determined	
1118	**Control of Emissions from Refinery Flares** *[Projected Emission Reduction: TBD]* Amendments may be necessary to address findings from the additional analysis required by the adopting resolution for the last amendment. Amendments may also be necessary to implement an AB 32 measure. *Naveen Berry 909.396.2363 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
Reg. XXVII	**Climate Change** *[Projected Emission Reduction: TBD]* Additional protocols may be added to Rules 2701 and 2702 and amendments to existing rules may be needed to address implementation issues. *Susan Nakamura 909.396.3105 CEQA: Krause 909.396.2706 Socio: Cassmassi 909.396.3155*
Reg. IV, IX, X, XI, XIV, XX, XXX and XXXV Rules	Rule developments/amendments may be needed to meet the requirements of state and federal laws related to climate change air pollutants.

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 12

PROPOSAL: Status Report on Major Projects for Information Management Scheduled to Start During Last Six Months of FY 2014-15

SYNOPSIS: Information Management is responsible for data systems management services in support of all SCAQMD operations. This action is to provide the monthly status report on major automation contracts and projects to be initiated by Information Management during the last six months of FY 2014-15.

COMMITTEE: No Committee Review

RECOMMENDED ACTION:
Receive and file.

Barry R. Wallerstein, D.Env.
Executive Officer

JCM:MAH:OSM:nv

Background
Information Management (IM) provides a wide range of information systems and services in support of all SCAQMD operations. IM's primary goal is to provide automated tools and systems to implement Board-approved rules and regulations, and to improve internal efficiencies. The annual Budget specifies projects planned during the fiscal year to develop, acquire, enhance, or maintain mission-critical information systems.

Summary of Report
The attached report identifies each of the major projects/contracts or purchases that are expected to come before the Board between January 1 and June 30, 2015. Information provided for each project includes a brief project description, FY 2014-15 Budget, and the schedule associated with known major milestones (issue RFP/RFQ, execute contract, etc.).

Attachment
Information Management Major Projects for Period January 1 through June 30, 2015

ATTACHMENT
February 6, 2015 Board Meeting
Information Management Major Projects
for the Period of January 1 through June 30, 2015

Item	Brief Description	Budgeted Funds	Schedule of Board Actions	Status
Systems Development, Maintenance and Support	Provide Development, Maintenance and Support for: • Web Application Development • E-Commerce Infrastructure • CLASS System Replacement • CLASS System(s) Enhancements • Version Upgrades	TBD	April 3, 2015	On Schedule

Double-lined Rows - Board Agenda items current for this month

Shaded Rows - activities completed

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 14

REPORT: Administrative Committee

SYNOPSIS: The Administrative Committee met on Friday, January 16, 2015. The Committee discussed various issues detailed in the Committee report. The next Administrative Committee meeting is scheduled for Friday, February 13, 2015 at 10:00 a.m.

RECOMMENDED ACTION:
Receive and file.

Dr. William A. Burke, Chair
Administrative Committee

GC

Attendance: Attending the January 16, 2015 meeting were Committee Members Mayor Dennis Yates and Supervisor Josie Gonzales at SCAQMD headquarters, and Chairman William Burke and Dr. Clark E. Parker, Sr. via videoconference.

ACTION/DISCUSSION ITEMS:

1. **Board Members' Concerns:** None

2. **Chairman's Report of Approved Travel:** Chairman Burke reported that Councilmember Judith Mitchell will be traveling to Sacramento to attend the Low Carbon Fuel Summit and the monthly CARB Board meeting.

3. **Approval of Compensation for Board Member Assistant(s)/Consultant(s):** None to report.

4. **Report of Approved Out-of-Country Travel:** None to report.

5. **Overview of District Authority with Respect to Mobile Sources:** Assistant Deputy Executive Officer Henry Hogo provided an overview of District authority in response to the Board's inquiries regarding the need to reduce mobile source emissions. Staff conducted an analysis of the District's mobile source authority, which included a comparison of the District's authority with that of CARB and U.S. EPA. The District has primary authority over setting emissions limits on all stationary sources except motor vehicles as well as indirect source authority over sources such as ports, railyards, and airports. CARB and U.S. EPA have primary authority over tailpipe emissions from motor vehicles. Staff has been working closely with CARB on the need for additional mobile source controls in order to meet the federal ozone air quality standard in 2032 and the annual PM2.5 standard in the 2025 timeframe.

Mayor Yates inquired whether we had authority over trains, ships and airplanes. Chief Deputy Counsel Barbara Baird responded that there are two possible areas where we would have authority. One area is the ability for the District to impose operational limits on those types of equipment, such as anti-idling provisions. The other area is under Indirect Source Review where this type of authority can apply to facilities that attract any type of mobile source, whether motor vehicles, off-road construction, ports, or railyards, which are all indirect sources. Mayor Yates asked if airplanes would be included in that group. Ms. Baird responded that airplanes are very difficult to control because the Clean Air Act gives the authority for emissions standards over them explicitly to U.S. EPA. In the past, staff has explored the concept of something called the "airport bubble" regulation which would be similar to an indirect source rule; however, we had an enormous amount of opposition from the local airports, but that could be explored again if the Board desires it. Mayor Yates inquired that if we do not have control over the airplanes, are we prohibited from controlling the airports. Dr. Wallerstein responded that one of the things discussed in the AQMP context is for the airlines to route their "clean air jets" to our District, much like the railroads expedited the implementation of Tier II locomotives in our region as a means of cleaning the air. That is a topic staff plans to examine in developing the 2016 AQMP and bring back to the Board for a more detailed discussion.

Dr. Burke commented that he had expected to get a report on what we can do, where we can do it, and how we can do it; however, he did not feel that was reported. Ms. Baird responded that the Board would be getting a more detailed confidential memorandum from General Counsel Kurt Wiese that details more of the issues related to the various things we can potentially do. Dr. Burke remarked that the airports are an important economic engine in the City of Los Angeles and the State of California, but emphasized that if we are really going to accomplish our mission, we need to carefully look at everything that is economically viable and find out where we can control the last remaining sources of relatively uncontrolled emissions to finish the job sooner. Dr. Burke directed staff to come

back to the Committee in March with specific actions that can be taken to further reduce emissions.

Dr. Parker commented that San Joaquin has Rule 9510 on indirect source review and inquired whether the District had a similar rule. Dr. Wallerstein responded that at this point we do not have a similar rule; however, he suspects that as we go through the 2016 AQMP there will be some community groups and environmental organizations that will encourage us to consider adoption of something similar since under state law we are required to have all feasible measures.

Supervisor Gonzales commented that she agrees with Dr. Burke that we need to look at every source and with the state and federal mandates which this agency and other environmentally-charged agencies have to meet, whether CARB or U.S. EPA, that there is an identification of each agency's responsibilities and the scope of their responsibilities. Where we find that we have no authority, we need to identify where there is authority, and if there is no authority to be identified, then address those issues with our state and federal representatives as a high means-assessment priority that needs to be done in order to help us meet their mandates.

6. **Overview and Discussion of the Review and Assessment Report of the Website Redesign and Content Management System Initiative:** Assistant Deputy Executive Officer Chris Marlia reported that about a month prior to the release of our new website, an independent design firm was hired to take a fresh, independent look at what the actual design company had designed and see if there were any major problems that would delay the website from going live. The independent contractor gave specific comments page-by-page as to minor things that could be fixed, such as spacing, formatting, and broken-link issues. However, her overall conclusion was that all these things were fairly minor and there was no real reason to delay deploying the website. She did, however, have a couple of areas that she thought we should address as we go further. One of those areas was better compliance with the Americans with Disabilities Act for people who have difficulty reading. There are tools that can be used to read our website and translate it into verbiage so people with disabilities can access it. In converting our site, the design firm incorporated a tool called "alt text" which can be put into the code behind our content that allows disabled web readers to read "behind the scene" descriptions. However, the alt text is not displayed on the browsers that non-disabled people can see and read when they view the website. These tools will make it easier for people with disabilities to read our web content.

Dr. Burke inquired whether staff had an ongoing conversation with the contractor on how to implement her suggestions. Mr. Marlia responded that there was not much dialogue because it was a short-term contract for a month before going live with the new website and staff already knew that there were tools available on the web that could be implemented to help us with this effort. Dr. Burke expressed

his concern as to why staff felt the pressure to go live if we had not complied with the disability aspects of the website. He asked why the contract was short-term if in a one-month analysis a significant problem was found with the website. He also asked how much the contract was for the firm who did the analysis and how much is spent on the system annually. Mr. Marlia responded that the contract was for $6,000 to $8,000 and significant resources are expended on the system each year. Dr. Wallerstein added that he will work with staff to address these issues.

Supervisor Gonzales commented that she went on our website and was specifically looking for the webcasts, wanting to add them to her Facebook page to increase viewer interest and participation at the local level. She had difficulty locating the webcasts or anything that referred to the meetings; she did, however, eventually find them under the category called "Library." For the average person, the library is a place where you go to find information, not to view meetings. We need to look at the website in a very simple manner and make it easy for anyone, especially the handicapped, to get to where they need to go in a very quick, direct manner, and maybe in one or two clicks.

Dr. Burke emphasized that we have to correct these problems because we live in a web-based society. If we are going to be part of the community, doing community outreach, we have to have the ability to interconnect with people in a logical, easy manner.

7. **Local Government & Small Business Assistance Advisory Group Minutes for the October 10, 2014 Meeting (written report):** Attached for information only are the minutes from the October 10, 2014 meeting of the Local Government & Small Business Assistance Advisory Group.

8. **Review of the February 6, 2015 Governing Board Agenda:** There were no questions regarding the February 6, 2015 Governing Board Agenda.

9. **Other Business:** None

10. **Public Comment:** None

Meeting adjourned at 11:00 a.m.

Attachment
Local Government & Small Business Assistance Advisory Group Minutes from the October 10, 2014 Meeting

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

LOCAL GOVERNMENT & SMALL BUSINESS ASSISTANCE ADVISORY GROUP FRIDAY, OCTOBER 10, 2014 MEETING MINUTES

MEMBERS PRESENT:
Dennis Yates, Mayor, City of Chino and LGSBA Chairman
Paul Avila, P.B.A. & Associates
Geoffrey Blake, Metal Finishers of Southern California/All Metals
Todd Campbell, Clean Energy
John Hill, Riverside County Representative
Maria Elena Kennedy, Kennedy Communications
Rita Loof, RadTech International

MEMBERS ABSENT:
Ben Benoit, Councilman, City of Wildomar and LGSBA Vice Chairman
Felipe Aguirre
Mary Ann Lutz, Mayor, City of Monrovia
Kelly Moulton, Paralegal
Lupe Ramos Watson, Councilmember, City of Indio

OTHERS PRESENT:
Mark Abramowitz, Board Member Assistant *(Lyou)*
David Rothbart, Los Angeles County Sanitation District

SCAQMD STAFF:
Sam Atwood, Media Manager
Nancy Feldman, Principal Deputy District Counsel
Elaine-Joy Hills, AQ Inspector II
Lori Langrell, Secretary
Fred Minassian, Director of Science & Technology Advancement
Guillermo Sanchez, Sr. Public Affairs Manager
Jill Whynot, Asst. Deputy Executive Officer

Agenda Item #1 - Call to Order/Opening Remarks
Mayor Dennis Yates called the meeting to order at 11:30 a.m.

Agenda Item #2 – Approval of September 12, 2014 Meeting Minutes/Review of Follow-Up/Action Items
Chair Yates called for approval of the September 12, 2014 meeting minutes. The Minutes were approved unanimously.

Mr. Guillermo Sanchez noted Ms. Rita Loof's request for an update on the American Society for Testing and Materials (ASTM) Volatile Organic Compound (VOC) test method and it would be agendized at a later meeting.

Agenda Item #3 –Check Before You Burn Program and Outreach Update

Mr. Sam Atwood provided an overview of the SCAQMD's wintertime Check Before You Burn program and outreach efforts for the 2014-15 season.

Mr. Paul Avila asked if there were still areas that use incinerators to burn trash. Mr. Atwood indicated not in our air district, but, for example, in San Luis Obispo County, they are able to burn trash, but must obtain a permit first. Mr. Avila further asked if there are still incinerators that remain active today. Mr. Atwood replied no since incinerators were banned in the 1950's.

Ms. Rita Loof asked if the SCAQMD has quantified the emissions reductions with cost. Mr. Atwood indicated that he will check with staff.

Action Item: *Determine emissions reductions achieved through the Check Before You Burn program.*

Mr. Avila inquired whether the ban is for residential only, or if businesses refrained from wood burning as well. Mr. Atwood responded the ban is on residential burning only.

Mr. Avila asked how are "no burn" days decided. Mr. Atwood indicated that the methodology is written into Rule 445. If the district Meteorologist forecasts particulate matter of 2.5 microns ($PM_{2.5}$) to exceed 30 micrograms per cubic meter, a no burn day is declared.

Agenda Item #4 – Potential Changes to Carl Moyer Program

Mr. Fred Minassian provided a report on discussions with the California Air Resources Board (ARB), the California Air Pollution Control Officers Association (CAPCOA), and other stakeholders to improve the effectiveness of the Carl Moyer Program.

Mr. Avila asked if the program assisted buses primarily. Mr. Minassian replied that the program assists mobile sources with over 14,000 gross vehicle weight. When compared to the Carl Moyer Program implemented in the other air districts, SCAQMD has had the most variety in types of vehicles helped, from locomotives, marine vessels, buses to trucks, and construction equipment.

Mr. Todd Campbell indicated that he attended the Incentive Program Advisory Group (IPAG) meeting held on October 9th, and was curious why no paperwork on the presentations were offered. He asserted that better input could have been provided if they had received background materials and proposals in a timely fashion. Mr. Minassian indicated that this was merely the initial session and ARB Board Member Sandra Berg Burke wanted to enhance the group discussions to bring up additional comments and ideas from the stakeholders prior to more detailed reports being drafted for dissemination.

Mr. Avila asked what type of changes was ultimately being sought. Mr. Minassian indicated the intent is to update the program to make it more effective. Some of the changes being discussed include such as leveraging funds and adjusting the cost-effectiveness determination, incorporating greenhouse gas emission reductions as a factor, and to allow the Moyer Program to be applied to a broader range of engine types.

Agenda Item #5 –Monthly Report on Small Business Assistance Activities
No comments.

Agenda Item #6 - Other Business
Mr. Geoff Blake asked for further information on the Rule & Control Measure Forecast informational attachment, and how can he find out more information about upcoming activities pertaining to a particular rule that is on the forecast. Ms. Jill Whynot indicated that a staff contact should be listed on each rule, and instead of searching through the website for upcoming activities, a request can be made to be placed on the mailing list for notification.

Agenda Item #7 - Public Comment
No comments.

Adjournment
The meeting adjourned at 12:14 p.m.

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 15

REPORT: Legislative Committee

SYNOPSIS: The Legislative Committee held a meeting on Friday, January 15, 2015. The next Legislative Committee meeting is scheduled for Friday, February 13, 2015 at 9 a.m. in Conference Room CC8.

The Committee deliberated on agenda items for Board consideration and recommended the following actions:

Agenda Item	Recommendation
H.R. 5101 (Hahn) National Freight Network Trust Fund Act of 2014	Support with Amendments
Proposed Changes to Carl Moyer Program - "The Five Pillars"	Approve

RECOMMENDED ACTION:
Receive, file this report, and approve agenda items as specified in this letter.

Josie Gonzales
Chair
Legislative Committee

LBS:GSA:jf

Attendance ***[Attachment 1]***
The Legislative Committee met on January 16, 2015. Committee Members, Chair Supervisor Josie Gonzales, and Councilmember Judy Mitchell were present at SCAQMD's Diamond Bar headquarters. Committee Members Supervisor Michael Antonovich, Councilmember Joe Buscaino and Dr. Clark Parker attended via videoconference. Dr. William A. Burke, Chair of the SCAQMD Governing Board, was appointed to the Legislative Committee and also attended via videoconference.

Update on Federal Legislative Issues
SCAQMD federal legislative consultant Mark Kadesh, of Kadesh & Associates, reported on Committee assignments. Senator Boxer will no longer serve on the Commerce Committee, but as Ranking Member on the Senate Environment and Public Works Committee working on the transportation bill, she plans to remain very involved in freight issues. Congressman Tony Cardenas will now serve on the Energy and Commerce Committee; Congresswoman Julia Brownley will serve on Transportation and Infrastructure Committee; Congressman Pete Knight will serve on Armed Services Committee; Congresswoman Mimi Walters will serve on both Judiciary and Transportation and Infrastructure Committees; Congresswoman Norma Torres on Homeland Security; Congressman Ted Lieu on Budget; Congressman Pete Aguilar on Agriculture and Services Committee.

Kadesh also reported on productive meetings SCAQMD staff recently had in Washington, D.C. with the offices of Senators Boxer and Feinstein as well as Congress members Aguilar, Hahn, Lieu, Lowenthal and Torres.

SCAQMD federal legislative consultant Mia O'Connell, of the Carmen Group, also updated the Committee on key meetings SCAQMD staff had in Washington D.C., with: Senator Inhofe, Chair of the Environment and Public Works Committee, and his principal staff who were acutely focused on the surface transportation reauthorization bill; key republican staff on House Transportation and Infrastructure who have aggressive plans to move the transportation bill in the spring; Office of Congressman Ken Calvert, Chair of the Interior and Environment Committee; and introductory sessions with new Congress members.

Executive Officer Barry Wallerstein clarified that he participated in the aforementioned meeting with Senator Inhofe and additionally was in Washington D.C. to participate in the National Transportation Research Board (TRB) annual meeting, serving as an ex officio member of the TRB Executive Committee. Dr. Wallerstein explained that the transportation community's hope is to pass a multiyear surface transportation reauthorization bill that addresses where funding will come from. There is a growing consensus that funding can be generated from user fees rather than taxes.

Dr. Parker asked if we knew whether funding was at risk for programs we were interested in. Dr. Wallerstein responded that we would have a better sense in the next few months, but it appears that for any major transportation bill to pass, bipartisanship and funding for environmental mitigation will be required.

Recommend Position on Federal Bill *[Attachment 2]*
Marc Carrel, Program Supervisor presented on H.R. 5101 (Hahn) National Freight Network Trust Fund Act of 2014. The bill was presented at the prior meeting of the Legislative Committee and staff was directed to return to the Committee with amendments to explicitly set aside a portion of the funding for air quality purposes. As introduced, this bill transfers five percent of all import duties collected by the U.S. Customs and Border Protections to a Freight Network Trust Fund for freight infrastructure improvements. It is anticipated that the bill would generate $1.9 billion annually for this purpose.

Staff recommended that the Committee adopt a position of SUPPORT AND RECOMMENDED AMENDMENTS that would:

1. Enable local and regional air quality to be eligible for grant funding on projects that would reduce the environmental impacts of freight movement;
2. Provide that no less than 10% of the funds available would be for grants for emission reductions;
3. Projects would be prioritized in those areas with high volumes of freight movement;
4. Eligible projects would include zero-emission and near-zero emission technologies and infrastructure.

In the ensuing discussion Dr. Parker clarified that whichever bill ultimately moves forward, the SCAQMD must send a message that any such bill must address transportation's environmental impacts. Councilwoman Mitchell asked whether such amendments would be considered overly "California centric." Marc Carrel responded that other regions in the nation have similar concerns, most notably New Jersey, New York and Texas.

The Committee's discussion focused on the amount of revenues that would be generated by the bill, what areas should be prioritized for funding, whether the funding should be spent in the metropolitan planning area where the custom duties are collected, the complexity of the customs tariffs schedule, and containerized versus bulk cargo. Staff was directed to report back to the Committee on how custom duties are collected and relative amount that is generated from the Ports of Los Angeles and Long Beach. Staff was further directed to arrange for a SCAQMD Board member lead meeting with Congresswoman Hahn to discuss our issues and the proposed amendments.

Pursuant to the discussion, the Legislative Committee modified Staff's proposed amendments as follows:

- The set-aside for air quality purposes to be raised to one third.
- Funding should be spent in the metropolitan planning area where the custom duties are collected.

The Legislative Committee unanimously adopted a position of SUPPORT AND RECOMMENDED AMENDMENTS FOR H.R. 5101, as modified.

Update on State Legislative Issues
SCAQMD state legislative consultant Will Gonzalez, of Gonzalez, Quintana & Hunter, briefed the Committee on key Sacramento issues. Governor Brown announced that he intended to increase the state's renewable energy goal to 50% by 2030 and also reduce the state's oil consumption by 50%. Details are still lacking and it is unclear under what authority the Governor would execute his plans. It may be possible, but not certain, that the Governor may act administratively through either the Public Utilities Commission or the California Air Resources Board (CARB). On the legislative side, Assembly Member Rendon and Senator Leno are contemplating a 50% renewables bill. Beyond significant cap and trade funds being used to incentivize further electric vehicle use, it is unclear how the 50% reduction in oil consumption would be achieved.

A significant milestone was reached on January 1 when fuels came under the cap and trade program for the first time. Despite concerns, there has been no spike in fuel prices so far. The next cap and trade auction will be in mid February and the Governor anticipates a billion dollars in revenues being generated, but others expect it to generate more than twice that.

SCAQMD state legislative consultant Paul Gonsalves, of Joe A. Gonsalves & Son, also briefed the Committee on other key Sacramento issues. Governor Brown released his January Budget proposal for the 2015-16 session, which is the kick-off for Budget negotiations that will continue until June 15, 2015, the constitutional deadline for the Legislature to adopt a budget. The Governor's January budget proposes $113.3 billion in General Funds with a projected growth of $4 billion through 2016. It also includes $2.4 billion for the newly enacted Proposition 2 (adopted by the voters in November), with $1.2 billion going to pay off debt and $1.2 billion to be deposited into the "rainy" day stabilization account. This will bring the state's rainy day account to $2.8 billion by June 2016.

Highlights of Governor's 2015-16 Budget include:

- $65 billion for K-12 and Community Colleges,
- $1 billion in Cap and Trade Revenues that will be invested in high speed rail,

low-carbon transportation, sustainable communities, energy efficiencies, and urban forests.
- $533 million repaid towards State Mandates,
- $532 million in Proposition 1 Water Bond revenues to implement the Water Action Plan
- The budget allocates the remaining $1.1 billion from the 2006 Flood Bond
- Modifications to Redevelopment Dissolution
- Prefunding Retiree Healthcare
- $478 million for critical deferred maintenance at universities and community colleges and in state parks, prisons, state hospitals and other state facilities.
- Court Ordered Modifications to Realignment in order to reduce prison population.

Despite calls to restore social service programs, the Governor's restrained budget has generally been well received and the Legislative Analyst's Office finds it a generally prudent plan that will help the state overcome the boom and bust budgeting of the last twenty years.

Dr. Burke noted that he understood there are cap and trade funds available for outreach and we should be working with our local electeds to secure funding for education and outreach opportunities. Paul Gonsalves will work with staff to identify those funds and develop those funding opportunities under cap and trade, SB 375, and other legislative programs.

Councilman Buscaino asked that Will Gonzalez facilitate a meeting with the three new legislators in the ports area. Board Members Burke and Buscaino would participate in that meeting.

Proposed Changes to Carl Moyer Program *[Attachment 3]*
Science & Technology Advancement Office Assistant Deputy Executive Officer, Fred Minassian, updated the Committee on the ongoing discussions with CARB, the California Air Pollution Control Officers Association, and other stakeholders to improve Carl Moyer program efficiencies and outcomes. These discussions have resulted in "Five Pillars" on which to build an enhanced Moyer Program which were approved by CARB. Staff requested approval of the document to guide legislative efforts this year.

The Legislative Committee unanimously approved "The Five Pillars" concept (Attachment 3) to guide SCAQMD's staff actions.

Report from SCAQMD Home Rule Advisory Group *[Attachment 4]*
Please refer to Attachment 4 for written report.

Other Business:
None

Public Comment Period:
No public comment.

Attachments
1. Attendance Record
2. Bill and Bill Analyses
3. Proposed Changes to Carl Moyer Program
4. SCAQMD Home Rule Advisory Group Report

ATTACHMENT 1

ATTENDANCE RECORD –January 15, 2015

DISTRICT BOARD MEMBERS:
Dr. William A. Burke (Videoconference)
Supervisor Josie Gonzales
Supervisor Michael Antonovich (Videoconference)
Councilmember Joe Buscaino (Videoconference)
Councilmember Judy Mitchell
Dr. Clark E. Parker, Sr. (Videoconference)

STAFF TO COMMITTEE:
Lisha B. Smith, Deputy Executive Officer
Derrick Alatorre, Assistant Deputy Executive Officer/Public Advisor
Guillermo Sanchez, Senior Public Affairs Manager (teleconference)
Julie Franco, Senior Administrative Secretary

DISTRICT STAFF:
Barry R. Wallerstein, Executive Officer
Barbara Baird, Chief Deputy Counsel
Elaine Chang, Deputy Executive Officer
Phil Fine, Assistant Deputy Executive Officer
Peter Greenwald, Sr. Policy Advisor
Fred Minassian Assistant Deputy Executive Officer
Chris Marlia, Assistant Deputy Executive Officer
Matt Miyasato, Deputy Executive Officer
Mohsen Nazemi, Deputy Executive Officer
William Wong, Principal Deputy District Counsel,
Marc Carrel, Program Supervisor
Tina Cox, Senior Public Information Specialist
Robert Paud, Telecommunications Technician II
Barbara Radlein, AQ Specialist
Kim White, Public Affairs Specialist
Patti Whiting, Staff Specialist

OTHERS PRESENT:
Mark Abramowitz, Governing Board Member Consultant (Lyou)
Tricia Almiron, SANBAG
Leila Barker, Los Angeles Department of Water and Power
Kris Flaig, City of Los Angeles
Jason Gonsalves, Joe A. Gonsalves & Son (teleconference)
Paul A. Gonsalves, Joe A. Gonsalves & Son (teleconference)
Will Gonzalez, Gonzalez, Quintana & Hunter, LLC (teleconference)
Stewart Harris, Carmen Group (teleconference)
Gary Hoitsma, Carmen Gruop (teleconference)
Mark Kadesh, Kadesh & Associates (teleconference)
Chris Kierig, Kadesh & Associates (teleconfernce)
Vlad Kogan, Orange County Sanitation District
Rita Loof, RadTech
Mia O'Connell, Carmen Group (teleconference)
Debra Mendelsohn, Governing Board Assistant (Antonovich)
David Rothbart, Los Angeles County Sanitation District
Andy Silva, Governing Board Assistant (Gonzales)
Susan Stark, Tesoro
Lee Wallace, So Cal. Gas
Warren Weinstein, Kadesh & Associates (teleconference)

ATTACHMENT 2

H.R. 5101 (Hahn)

The National Freight Network Trust Fund Act of 2014

Summary:

Transfers five percent of all import duties collected by U.S. Customs and Border Protection to a Freight Trust Fund for freight transportation projects.

Background:

Freight transportation is an essential part of the global economy. The U.S. freight sector is expected to grow dramatically in the coming years. By 2020, 90.1 million tons per day of freight are expected to move throughout the United States, a 70% increase over 2002.

This freight movement is critical to a robust economy but comes at a high price for the environment and local communities that suffer from its impacts. The freight sector alone represents nearly a quarter of the transportation sector's greenhouse gas emissions, or approximately 8% of total U.S. carbon dioxide emissions. The fine particle pollution from U.S. diesel engines, the most common engines used in freight, is estimated to shorten the lives of nearly 21,000 people each year nationwide.[1] The projected trade increases could place even greater strains on public health and the environment, and add more congestion to the already overburdened and deteriorating highway, rail, and waterway system.

Southern California's South Coast Air Basin, home to five percent of the U.S. population and over forty percent of the State of California's population is a global gateway for trade. Approximately 40% of all the nation's containerized goods enter through the Ports of Los Angeles and Long Beach then are transported by highways and railways to the rest of the nation. These goods are placed on store shelves nationwide, thus having an economic impact on every U.S. Congressional district. The burden of this national economic benefit, disproportionately impacts the health of Southern California communities along our freight transportation system corridors.
While the freight system is important to the health of Southern California's economy, it takes a significant toll on the health and quality of life of local communities. Increasing volumes of freight movement require simultaneous and continuous improvement in pollution control strategies to reduce health impacts.

Southern California residents who live near transportation corridors and facilities served by ships, trains, and heavy-duty trucks have higher risks of asthma and other health related impacts, and cancer risks are elevated in communities miles from the ports. Diesel emissions from freight activities in the region are also major contributors to regional air pollution that the California Air Resources Board estimates annually cause thousands of premature deaths, hospitalizations, cases of asthma and lower respiratory symptoms and hundreds of thousands of lost work days.

[1] Schneider, C., L. B. Hill, "Diesel and Health in America: The Lingering Threat." Clean Air Task Force, Feb. 2005, http://catf.us/publications/reports/Diesel_Health_in_America.pdf.

Zero and near-zero-emission advanced technologies, along with land use approaches, and policy and regulatory initiatives are important tools for reducing these impacts and improving community health, and will be needed for the region to attain national air quality standards as required by federal law.

MAP-21, the surface transportation authorization law, was enacted in 2012. That law contains several provisions related to freight, but did not establish a funding source for most freight programs. In addition, the Highway Trust Fund (HTF), the major federal funding source for highway and transit projects is nearing insolvency. Funded from federal fuel taxes on gasoline and diesel fuel, the fund is used for highway construction and maintenance, highway safety, and transit projects. Due to the imminent threat of running out of money in August 2014, Congress passed a stopgap plan on July 31, 2014 to prevent a funding lapse. But this stopgap measure does not provide funding beyond May 2015.

There is no clear solution for increasing the funds in the HTF, which have diminished since cars are more fuel efficient (and thus using less gasoline), cars have been driven less during the recent recession, and drivers with alternative-fueled vehicles do not pay into the HTF if their cars do not use gasoline or diesel. Because of the lack of HTF funding, there is little support for expanding the HTF to fund freight projects, particularly those not directly related to highway transportation.

Thus, there has been an effort, strongly supported by Southern California transportation stakeholders, to establish a sustainable, dedicated source of funding for freight projects. This bill would provide a dedicated funding source for freight that is stable and sustainable.

This bill would transfer five percent of all import duties collected by U.S. Customs and Border Protection (U.S. CBP) to a Freight Trust Fund for transportation projects. U.S. CBP currently collects $38 billion in import duties annually. If passed, the measure would generate approximately $1.9 billion for the fund each year. This legislation also would direct the U.S. Department of Transportation to work with the National Freight Advisory Committee to identify necessary improvements to the nation's freight system and provide grants for the improvements.

Status:
On July 14, 2014, the bill was introduced and referred to the House Committee on Transportation and Infrastructure and the House Committee on Ways and Means. No hearings are set on this bill.

Specific Provisions:
H.R. 5101, The National Freight Network Trust Fund Act of 2014, amends the Internal Revenue Code to establish the National Freight Network Trust Fund. Under this bill, five percent of the import duties imposed under the Harmonized Tariff Schedule of the United States (Customs duties) would be appropriated to this Trust Fund. The Trust Fund would be used to provide grants under the newly-created National Freight Network Grant Program.

Under this grant program, the Secretary of Transportation would make competitive grants to states, regional or local transportation organizations, or port authorities to assist "any project that improves the performance of the national freight network."

Projects would be evaluated and selected on a competitive basis by considering their potential to:

- generate national economic benefits,
- improve the performance of key corridors and gateways,
- reduce congestion,
- improve transportation safety, and
- enhance the network.

The Federal share of the cost of a project assisted with a grant under the program shall be 90 percent of the total project cost.

This bill uses a much more expansive definition of the National Freight Network than that used in MAP-21. Under this bill, the national Freight Network would be defined as all routes included in the national freight network established by U.S. DOT pursuant to MAP-21, but would also include: roads and rail lines that connect such network to a port; on-dock rail; projects that appear in a State freight plan; projects that appear in a regional transportation plan; railway-highway grade separations, and high freight volume roadway or rail corridors that provide connectivity for ports, intermodal connectors, multimodal freight facilities, multistate freight corridors, international borders, or airports.

Impacts on SCAQMD's Mission, Operations or Initiatives:
This legislation would have an impact on the South Coast Air Basin as it would fund projects related to improving the national freight network. In Southern California, I-405, I-710, I-210, I-605, I-215, I-10, I-5 and SR 91 have all been proposed to be designated as part of the Draft Highway Primary Freight Network. So funding dedicated to improving aspects of these routes would be beneficial to reducing congestion and increasing mobility across these freeways.

In addition, at its May 2014 meeting, the SCAQMD Governing Board approved a set of eight federal legislative proposals related to the federal transportation law and the upcoming reauthorization of the MAP-21 law and the federal passenger rail law. The set contains five proposals that seek to create a more sustainable goods movement supply chain and the infrastructure that supports it, namely infrastructure improvement projects to complement local, state and private investment for ports, key freight corridors and assets, as well as efforts to reduce environmental impacts imposed upon local communities. Two other proposals relate to providing funding to replace existing commuter rail with the cleanest (Tier 4) locomotives. The last proposals would amend the Clean Air Act by requiring U.S. EPA to address emissions from federal sources that could not be addressed by the SIP.

SCAQMD's proposals use incentives and grant programs to increase the number of zero- and near-zero emission trucks, freight locomotives and cargo handling equipment, seek to expand the number

of refueling and recharging facilities for those vehicles, and promote highway infrastructure that promotes the use of cleaner freight vehicles (such as dedicated zero-emission truck lanes).

The commitment made to the region's transportation agencies is that SCAQMD would not support using existing HTF funds for these proposals, but would look for other sustainable funding sources, and would try to identify funding from other sources. H.R. 5101 provides a sustainable funding source.

However, H.R. 5101, despite its innovative approach to using a portion of existing U.S. Customs fees for improvements to the nation's freight system, does not go far enough. Its language is too limiting for our purposes. For instance, none of the SCAQMD MAP-21 proposals would be eligible under its existing language, SCAQMD would not be eligible to use funds, and the current bill does nothing to reduce or mitigate the environmental impacts of freight on local communities.

Discussion at December 12, 2014 Legislative Committee Meeting:
Staff proposed supporting this bill and recommended amendments to strengthen it. These amendments would add language to enable local and regional air quality agencies to receive grants and would enable those grants to be for projects reducing the environmental impacts of freight movement.

Dr. Clark E. Parker, Sr., expressed concerns that air quality should be a larger part of the bill, and that there should be an explicit set-aside in this bill for air quality. SCAQMD Executive Officer Dr. Barry Wallerstein likened this concept to how Proposition 1B (The Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006), established a 5% set-aside for projects reducing emissions from activities related to freight movement. The 5% set aside was equivalent to $1 Billion of the Act's total $20 Billion price tag. Proposition 1B passed in 2006 with 61.3% approval.

The Committee ultimately supported the bill with these amendments in concept and asked staff to return at the January 2015 Legislative Committee meeting with specific language creating a set aside.

Recommended Position: SUPPORT AND RECOMMEND AMENDMENTS

Staff recommends keeping the previously recommended amendments and adding additional amendments which will:

- establish a 10% set-aside of the funds collected for the National Freight Network Trust Fund to be used for projects or programs that reduce emissions of criteria pollutants, toxic air contaminants and greenhouse gases.
- The Secretary must prioritize these grants for projects or programs in areas with high volumes of freight movement.
- These grants could be used for developing, demonstrating and deploying zero and near-zero emission freight movement technologies, and for infrastructure that enables, incentivizes or

incorporates those technologies. This would include alternative fuel fueling facilities, electric vehicle charging facilities, and truck lanes dedicated to (or substantially incentivizing) the use of zero and near-zero emission vehicles.

Proposed amendments are as follows:

SEC. 3. NATIONAL FREIGHT NETWORK GRANT PROGRAM.

(a) Establishment.--There is hereby established in the Department of Transportation a National Freight Network Grant Program (in this section referred to as the "Program") to improve the performance of the national freight network.

(b) Grant Authority.--Under the Program, the Secretary of Transportation, in accordance with the national freight strategic plan developed under section 167 of title 23, United States Code, may make a grant to assist any project that improves the performance of a segment of the *national freight network or reduces the environmental impacts of freight movement on the* national freight network.

(c) Grant Recipients.--Under the Program, the Secretary may make a grant to the following:

(1) A State.

(2) A regional or local transportation organization.

(3) A port authority.

(4) A regional or local air quality agency.

(d) Applications.--To be eligible for a grant under the Program, an entity specified in subsection (c) shall submit to the Secretary an application regarding a proposed project at such time, in such form, and containing such information as the Secretary determines is appropriate.

(e) Selection Criteria.--In making grants under the Program, the Secretary shall evaluate and select projects on a competitive basis by considering the potential of the projects to--

(1) generate national economic benefits;

(2) improve the performance of key corridors and gateways;

(3) reduce congestion;

(4) improve transportation safety; ~~and~~

(5) enhance the national freight network*; and*

(6) reduce the environmental impacts of freight movement.

(f) *No less than ten percent (10 %) of funds available for grants under this section shall be used for projects or programs which support actions, not otherwise required by law, which reduce emissions of criteria pollutants, toxic air contaminants and greenhouse gases. The Secretary shall prioritize funding under this subsection for projects or programs in areas with high volumes of freight movement.*

(g) Grants pursuant to paragraph (f)(1) shall be for one or more of the following:

(1) Development, demonstration and deployment of zero and near-zero emission freight movement technologies (as defined by the Administrator of the Environmental Protection Agency).

(2) Infrastructure that enables, incentivizes or incorporates use of technologies, specified in paragraphs (1) and (2), which shall include but not be limited to alternative fuel fueling facilities, electric vehicle charging facilities, and truck lanes dedicated to (or substantially incentivizing) the use of zero and near-zero emission vehicles.

(*h*) Federal Share.--The Federal share of the cost of a project assisted with a grant under the Program shall be 90 percent.

(~~g~~*i*) Authorization of Appropriations.--There is authorized to be appropriated each fiscal year to carry out the Program the amounts available in the National Freight Network Trust Fund established under section 9512 of the Internal Revenue Code of 1986.

(h) National Freight Network Defined.--In this section, the term ``national freight network'' means--

(1) the national freight network established under section167 of title 23, United States Code;

(2) roads and rail lines that connect such network to a port;

(3) on-dock rail;

(4) projects that appear in a State freight plan;

(5) projects that appear in a regional transportation plan;

(6) high freight volume roadway or rail corridors that provide connectivity for--

(A) ports;

(B) intermodal connectors;

(C) multimodal freight facilities;

(D) multistate freight corridors;

(E) international borders; or

(F) airports; and

(7) railway-highway grade separations.

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

ATTACHMENT 2B

I

113TH CONGRESS
2D SESSION

H. R. 5101

To establish a National Freight Network Trust Fund to improve the performance of the national freight network, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JULY 14, 2014

Ms. HAHN (for herself, Mr. POE of Texas, Mr. RICHMOND, Mr. LOWENTHAL, Mr. GENE GREEN of Texas, Mr. NOLAN, Mr. RUSH, and Ms. FUDGE) introduced the following bill; which was referred to the Committee on Transportation and Infrastructure, and in addition to the Committee on Ways and Means, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

---

A BILL

To establish a National Freight Network Trust Fund to improve the performance of the national freight network, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''National Freight Network Trust Fund Act of 2014''.

SEC. 2. NATIONAL FREIGHT NETWORK TRUST FUND.

(a) IN GENERAL.—Subchapter A of chapter 98 of the Internal Revenue Code of 1986 is amended by adding at the end the following new section:

"SEC. 9512. NATIONAL FREIGHT NETWORK TRUST FUND.

''(a) CREATION OF TRUST FUND.—There is hereby established in the Treasury of the United States a trust fund to be known as the 'National Freight Network Trust Fund', consisting of such amounts as may be appropriated or credited to such Trust Fund as provided in this section and section 9602(b).

''(b) TRANSFERS TO TRUST FUND.—There are hereby appropriated to the National Freight Network Trust Fund amounts equivalent to 5 percent of the import duties imposed under the Harmonized Tariff Schedule of the United States.

''(c) EXPENDITURES.—Amounts in the National Freight Network Trust Fund shall be available as provided in appropriations Acts only for making expenditures to fund awards under the National Freight Network Grant Program established under section 3(a) of the National Freight Network Trust Fund Act of 2014.''.

(b) CLERICAL AMENDMENT.—The table of sections for subchapter A of chapter 98 of such Code is amended by adding at the end the following new item:

''Sec. 9512. National Freight Network Trust Fund.''.

SEC. 3. NATIONAL FREIGHT NETWORK GRANT PROGRAM.

(a) ESTABLISHMENT.—There is hereby established in the Department of Transportation a National Freight Network Grant Program (in this section referred to as the ''Program'') to improve the performance of the national freight network.

(b) GRANT AUTHORITY.—Under the Program, the Secretary of Transportation, in accordance with the national freight strategic plan developed under section 167 of title 23, United States Code, may make a grant to assist any project that improves the performance of a segment of the national freight network.

(c) GRANT RECIPIENTS.—Under the Program, the Secretary may make a grant to the following:

(1) A State.

(2) A regional or local transportation organization.

(3) A port authority.

(d) APPLICATIONS.—To be eligible for a grant under the Program, an entity specified in subsection (c) shall submit to the Secretary an application regarding a proposed project at such time, in such form, and containing such information as the Secretary determines is appropriate.

(e) SELECTION CRITERIA.—In making grants under the Program, the Secretary shall evaluate and select

projects on a competitive basis by considering the potential of the projects to—

(1) generate national economic benefits;

(2) improve the performance of key corridors and gateways;

(3) reduce congestion;

(4) improve transportation safety; and

(5) enhance the national freight network.

(f) FEDERAL SHARE.—The Federal share of the cost of a project assisted with a grant under the Program shall be 90 percent.

(g) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated each fiscal year to carry out the Program the amounts available in the National Freight Network Trust Fund established under section 9512 of the Internal Revenue Code of 1986.

(h) NATIONAL FREIGHT NETWORK DEFINED.—In this section, the term ''national freight network'' means—

(1) the national freight network established under section 167 of title 23, United States Code;

(2) roads and rail lines that connect such network to a port;

(3) on-dock rail;

(4) projects that appear in a State freight plan;

(5) projects that appear in a regional transportation plan;

(6) high freight volume roadway or rail corridors that provide connectivity for—

(A) ports;

(B) intermodal connectors;

(C) multimodal freight facilities;

(D) multistate freight corridors;

(E) international borders; or

(F) airports; and

(7) railway-highway grade separations.

SEC. 4. NATIONAL FREIGHT POLICY.

Section 167(c)(1) of title 23, United States Code, is amended by inserting ", and update every 5 years thereafter," after "shall establish".

○

ATTACHMENT 3

The Five Pillars

To expand funding opportunities for the Carl Moyer Program, several meetings were held between CARB and CAPCOA in a group formed as the "Tactical Working Group". In these meetings all the areas requiring legislative actions, which would enable changes to the program guidelines were discussed and identified. These areas were further discussed with participating stakeholders in two Incentive Program Advisory Group (IPAG) meetings under the leadership of CARB Board member Sandra Berg. During these IPAG meetings, CARB, CAPCOA, and the participating stakeholders agreed upon five general categories requiring legislative actions. As such, each category was identified as a "pillar". The five pillars are described below:

1. Leveraging Funds:
   Currently any cofounding to a Carl Moyer project from federal, state, or local entities must be added to the Moyer funds in the overall cost-effectiveness calculations for that specific project. This limits the amount of Carl Moyer funds that could otherwise be provided and limits the program's ability to fund projects. A legislative change will allow leveraging the Carl Moyer funds with other funding sources, especially those with the lowest emitting technologies

2. Project Categories:
   The adoption of several on- and off-road regulations by CARB during the past few years has limited the eligibility of several project categories. An expansion of eligible project categories would increase the demand for the Carl Moyer Program and would help increase the potential for surplus emissions reductions. These could for example include infrastructure projects that would support and enhance penetration of low-emitting and commercially certified technologies; funding of marine vessel and locomotive projects with the AB 923 funds under the Carl Moyer Program; and funding of some new technologies.

3. Cost-Effectiveness Limit:
   The delta between the required and the optional emission standards have decreased drastically during the past few years due to availability of new technologies and low emission certification levels. As a result the available funding amounts per project have generally decreased. The ability to increase the cost-effectiveness limit will remedy this problem to a great extent.

4. Greenhouse Gases (GHG)
   Currently potential GHG reductions are not eligible for funding under the Carl Moyer Program. The option of being able to include GHG reductions in addition to the NOx, PM and ROG reductions would open new opportunities for funding. Further discussions would be needed on the calculation methodologies, and as to how incorporate the GHG reductions with the criteria pollutants targeted in the Carl Moyer Program.

5. Improve Implementation Efficiency
   CARB and CAPCOA are working to identify Program areas that could be modified to improve the ability to meet State and local air quality goals, while streamlining the process. These include increasing resources to enhance the ability of districts to reach out to disadvantaged communities and modifying requirements to ensure that a district will have sufficient time to expend funds in its area, eliminating the need to return them to CARB for redistribution.

ATTACHMENT 4

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

LEGISLATIVE REPORT
FROM HOME RULE ADVISORY GROUP
MEETING OF DECEMBER 17, 2014

HRAG members present:
Dr. Joseph Lyou, Chairman
Dr. Philip Fine on behalf of Elaine Chang, SCAQMD
Elizabeth Adams, EPA (participated by phone)
Curt Coleman, Southern California Air Quality Alliance
Jaclyn Ferlita, ClimeCo
Chris Gallenstein, CARB (participated by phone)
Jayne Joy, Eastern Municipal Water District (participated by phone)
Bill LaMarr, California Small Business Alliance
Rongsheng Luo, SCAG (participated by phone)
Terry Roberts, American Lung Association of California
David Rothbart, Los Angeles County Sanitation Districts
Larry Rubio, Riverside Transit Agency (participated by phone)
Lee Wallace, So Cal Gas and SDG&E

AQMD Staff: Barbara Baird, Guillermo Sanchez, Jill Whynot, Bill Wong, and Marilyn Traynor

Others: Mark Abramowitz (Board Consultant to Dr. Lyou); Daniel McGivney (SoCalGas/SDG&E); Rita Loof (RadTech), Lyndy Lewis (IRWD), and Norma Rozenstraten (Eastern Municipal Water District, by phone).

LEGISLATIVE UPDATE

Guillermo Sanchez reported on the following items that were discussed at the Legislative Committee meeting on December 12, 2014:

Federal

The committee discussed the following bills which are not expected to move forward this year:

Bills	Description	Action
H.R. 5101 (Hahn)	The National Freight Network Trust Fund Act of 2014	The Legislative Committee took no position but directed staff to develop proposed amendments to be considered at the next Legislative Committee meeting.
H.R. 5624 (Lowenthal)	Economy in Motion: The National Multimodal and Sustainable Freight Infrastructure Act	The Legislative Committee adopted staff's recommend position of support with amendments

H.R. 5101 (Hahn)
This bill sets aside five percent of existing import duties to fund freight infrastructure improvements, generating about $2 billion a year. The Committee discussed how the bill or any successor bill should be strengthened so that the air quality components are more delineated. The Legislative Committee took no position on H.R. 5101 (Hahn) and instead directed staff to develop proposed amendments to the bill that could be considered at the next Committee meeting.

H.R. 5624 (Lowenthal)
This bill sets aside $8 billion for freight infrastructure improvements—50% would be divided among the states pursuant to a formula based on the state's existing freight infrastructure, and 50% would be available through a competitive grant system open to all local, regional, and state governments. However, the funding source has not been identified. The Legislative Committee adopted a position of support with amendments that change the five percent annual set aside for freight electrification demonstration project to a fuel neutral program for "zero-emission" freight demonstration projects.ah(

Discussion
Bill LaMarr asked for additional background on the Legislative Committee's recommendations on H.R. 5101 and H.R. 5624. Mr. Sanchez responded that the main recommendation was for staff to continue discussions to move the bills forward, and the Legislative Committee requested staff to work with the bill authors on strengthening the air quality component of these bills or to the successor to MAP 21.

State
The new members of the state legislature were sworn in on December 1, 2014. The new Assembly leadership has been named and is notable for the number of junior members on the team. In fact, every member of the leadership team has only two years of experience or less.

Discussion
Dr. Lyou asked what staff anticipates the hot air quality/greenhouse gas topics will be in the state legislature this year. Mr. Sanchez responded that discussions continue on how cap-and-trade funds should be used, whether regulations need to be rolled back, whether further exemptions need to be created, and/or whether implementation should be delayed. Mr. LaMarr asked what the position is of the environmental community on the cap-and-trade monies. Dr. Lyou responded that the Coalition for Clean Air has been working very hard to ensure that all of the AB32 revenue and the SB535 money is spent appropriately to result in real successes, and he believes that there is consensus among the mainstream environmental groups and the community-based organizations to use these funds responsibly on projects that will be successful.

Back to Agenda

BOARD MEETING DATE: February 6, 2015 AGENDA NO. 16

REPORT: Mobile Source Committee

SYNOPSIS: The Mobile Source Committee met on Friday, January 23, 2015. Following is a summary of that meeting. The next Mobile Source Committee meeting is scheduled for Friday, February 20, 2015 at 9:00 a.m.

RECOMMENDED ACTION:
Receive and file.

Dr. Clark E. Parker, Sr., Chair
Mobile Source Committee

EC:fmt

Attendance

Committee Chair Dr. Clark E. Parker, Sr., and Committee Member Mayor Ben Benoit attended via videoconference; Committee Member Dr. Joseph Lyou attended the meeting at the SCAQMD Diamond Bar headquarters; and Committee Members Councilmember Judith Mitchell and Supervisor Shawn Nelson were absent.

The following items were presented:

INFORMATIONAL ITEM:

1) **Supplement to the 24-hour PM2.5 State Implementation Plan for the South Coast Air Basin**
Dr. Philip Fine, Assistant Deputy Executive Officer /Planning, Rule Development & Area Sources, discussed how the 2012 Air Quality Management Plan (AQMP) demonstrated attainment of the 2006 24-hour PM2.5 federal standard (35 $\mu g/m^3$) by 2014 following the guidance and requirements under Subpart 1 of the Clean Air Act (Title 1, Part D). However, a court decision compelled U.S. EPA to require compliance with PM10 requirements under Subpart 4 (CAA Title 1, Part D) ruling

that PM2.5 is a subset of PM10. Under Subpart 4, PM nonattainment areas are classified as moderate or serious, and the South Coast Air Basin is considered moderate. Subpart 4 requires attainment as expeditiously as practicable, but no later than the end of the sixth calendar year after designation which, for the 2006 24-hour PM2.5 standard, would be December 31, 2015. Subpart 4 allows for 2 one-year extensions if certain conditions are met.

Dr. Fine provided the last three years of 24-hour PM2.5 concentrations in Mira Loma, the only area in the South Coast Air Basin that has exceeded the standard. The values demonstrated it is not likely that the 24-hour PM2.5 standard will be achieved in 2014. The primary reason for nonattainment is the drought and lack of rainfall during the 2013-2014 season, causing less crusting and wetting of soil and surfaces and fewer days of wash-out and enhanced pollution dispersion.

A Supplement to the 24-hour PM2.5 State Implementation Plan (SIP) for the South Coast Air Basin has been prepared that demonstrates attainment of the 24-hour PM2.5 standard by 2015 along with a discussion of the effects from the drought. In addition, the Supplement includes a new transportation conformity budget for 2015, updated analysis of Reasonably Available Control Measures (RACM)/ Reasonably Available Control Technology (RACT), compliance with precursor requirements in the Clean Air Act (CAA) and an updated list of control strategy commitments and timelines.

The Supplement concluded that attainment of the 24-hour PM2.5 standard is projected by 2015. The U.S. EPA criteria for RACM/RACT acceptability have been satisfied as well as the CAA precursor requirements that includes the determination that one PM precursor, ammonia, from major sources (i.e., four facilities which are over 100 tons/yr) does not contribute significantly to PM2.5 levels. No additional contingency control measures are being proposed. Finally, Dr. Fine outlined the public availability of the document, the dates of the regional public hearings including the February 6, 2015 Board meeting where the SCAQMD Board will consider the approval of the Supplement. It was also determined that the Supplement is exempt from the requirements of the California Environmental Quality Act and socioeconomic analysis.

Dr. Parker asked if the continuing nonattainment of the 24-hour PM2.5 standard will have an effect on meeting the new annual PM2.5 standard. Dr. Fine noted that the proposed Supplement would be addressing the 24-hour PM2.5 standard and not the new annual PM2.5 standard. However, the attainment date of the new annual PM2.5 standard of 12 $\mu g/m^3$ would be between 2020 and 2025, and with the co-benefits from the ozone control strategy, PM2.5 levels should be close to the standard by then. However, new PM2.5 control measures might be needed to ensure attainment, and the need for new measures and which measures would be the most effective will be analyzed in the upcoming 2016 AQMP.

Dr. Lyou questioned the ability to attain the 24-hour PM2.5 standard by the end of this year if drought conditions do not change and there is no additional PM control being proposed. Dr. Lyou commented that the 2015 24-hour PM2.5 concentration would have to be at least 33.7 $\mu g/m^3$ or lower to meet the 3-year average (98th percentile) concentration standard of <35.4 $\mu g/m^3$. Dr. Fine commented that this level might be achievable, if the recent and predicted rains could return us to a regular rainfall season and the historical downward trend of PM2.5. Furthermore, there has been increased outreach in the Mira Loma area to encourage wood appliance change outs for cleaner burning alternatives. Mr. Henry Hogo, Assistant Deputy Executive Officer/Science & Technology Advancement, mentioned that reduced PM and SO2 emissions from ships within 200 miles of the coast are expected this year under the International Maritime Organization Emission Control Areas zone; however, Dr. Lyou noted that the activity slowdown at the Ports might adversely affect air quality by causing ships to wait in the harbor, causing additional emissions. Dr. Lyou encouraged the promotion of the "bonnet" technology that should also reduce emissions, even before it gets certification from ARB.

Dr. Parker agreed with Dr. Lyou and emphasized the possible need for more PM control strategies to further reduce PM and ensure the standards are met. Dr. Parker also questioned how to generate major PM reductions if sources such as trucks are not regulated by the SCAQMD.

Mayor Benoit inquired as to the sources of road dust emissions and the effects from Santa Ana weather conditions. Dr. Fine replied that road dust emissions are created from both paved and unpaved roads. Vehicles on paved roads produce PM2.5 emissions from brake wear, tire wear, and entrained on-road dust. Because there are more vehicle miles traveled on paved roads, PM2.5 emissions are higher overall than those generated from unpaved roads. With regard to Santa Ana weather conditions, larger particles are typically re-suspended with those conditions, so we don't necessarily see elevated PM2.5 levels.

Dr. Parker requested that staff provide a matrix of the specific sources that contribute to the PM2.5 emissions (e.g., diesel trucks, road dust) and the percent contribution. Staff committed to compiling a profile of the PM2.5 emission sources from inventory data and some of the previously preformed sensitivity analyses that aid in crafting the PM2.5 control strategy.

2) **2014 Ozone Season and Ongoing Air Quality Trends**

Mr. Joe Cassmassi, Planning and Rules Manager, briefed the committee on the 2014 ozone season and ongoing trends of both ozone and PM2.5. He noted that a brief upturn in the number of days exceeding the ozone standard was attributable to late summer/early fall heat waves that impact the Basin. Mr. Cassmassi indicated that the

trends of air quality continued to improve with shorter smog seasons and restricted ozone impact areas. Mr. Cassmassi discussed PM2.5 and the impact of the drought on particulate air quality. He noted that the frequency of rain events could be used to calibrate the impact of the drought to account for the observed increased number of high PM2.5 days. Without the drought, the trend of PM2.5 was on track to meet the federal standard. Mr. Cassmassi concluded with a preliminary discussion of the January 2015 PM2.5 data from the Federal Equivalent Method station data. He indicated that the predicted home fireplace burning restrictions were targeting the high days but staff was still evaluating the impact of the program effectiveness on the observed air quality.

Dr. Parker noted that water washes away PM2.5 particles; however, the rain on January 10 & 11, 2015 did not seem to have an effect on the Mira Loma results. Mr. Cassmassi responded that rain is an effective mechanism; however, the rain may not have had an effect those days because it was more towards Los Angeles and Orange counties and not that much in Riverside County or there could have been an issue with the monitor. Dr. Fine added that the data was collected using the Federal Equivalent Method continuous monitoring instruments, (not the Federal Reference Method), which does have some interferences and biases when it is moist outside. The Federal Reference Method data, once it becomes available, will have the actual numbers and will be compared to the real-time data collected.

Dr. Lyou commented that although the maximum annual ozone concentration was presented to indicate the trend, other indices need to be presented to augment the analysis. Dr. Fine responded that the 4th highest maximum concentration is typically used for that purpose. Dr. Lyou requested that we present the data in the form of the standard we are held to.

Dr. Lyou asked to what extent climate impacts are having on our modeling assumptions. Mr. Cassmassi referred to a University of California at Davis analysis that indicated warmer temperatures forecast for the deserts may shield the Basin from overt impacts due to climate change. Mr. Cassmassi also stated that the impact of land use changes may have a significant impact to localized wind flow which may alter transport patterns in the Basin and smog formation. Dr. Lyou also requested that staff include the state standard as well as the federal standard as the state standard also has to be met.

Dr. Parker inquired about the height of the inlets to the air monitoring stations and whether the air quality was representative of population exposure. Mr. Cassmassi responded that the inlets are about two to three meters above ground. Mr. Cassmassi further noted that the monitoring criteria are specified in the Clean Air Act; therefore, the actual placement of the intake is consistent across the network.

WRITTEN REPORTS:

3) **Rule 2202 Activity Report**
The report was received as submitted.

4) **Monthly Report on Environmental Justice Initiatives – CEQA Document Commenting Update**
The report was received as submitted with the following comment. Dr. Lyou expressed concern that the CEQA document for the Brickyard Commerce Center, a 1.43 million square foot warehouse distribution building in Compton, is only a Negative Declaration, meaning that no significant impacts were identified for all environmental topics. Dr. Lyou stated that he wants to be sure that staff is vigilant when commenting on projects. Dr. Elaine Chang, Deputy Executive Officer/Planning, Rule Development & Area Sources, responded that staff did prepare a comment letter, and that staff will provide a link to the comment letter to the committee members.

OTHER BUSINESS:
None

PUBLIC COMMENT:
None

The meeting was adjourned at 10:11 a.m.

Attachment
Attendance Roster

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
MOBILE SOURCE COMMITTEE MEETING
Attendance Roster- January 23, 2015

NAME		AFFILIATION
Dr. Clark E. Parker, Sr.		SCAQMD Governing Board *(via videoconference)*
Dr. Joseph Lyou		SCAQMD Governing Board
Mayor Ben Benoit/		SCAQMD Governing Board *(via videoconference)*
Board Asst/Consultant Mark Abramowitz/		SCAQMD Governing Board (Lyou)
Board Asst/Consultant Chung Liu		SCAQMD Governing Board (Mitchell)
Curtis Coleman		Southern California Air Quality Alliance
Kris Flaig		Los Angeles Bureau of Sanitation
Susan Stark		Tesoro
David Rothbart		Los Angeles County Sanitation Districts
Lee Wallace		Southern California Gas/San Diego Gas & Electric
Bill Pearce		Boeing
Elaine Chang		SCAQMD Staff
Philip Fine		SCAQMD Staff
Barbara Baird		SCAQMD Staff
Henry Hogo		SCAQMD Staff
Peter Greenwald		SCAQMD Staff
Laki Tisopulos		SCAQMD Staff
Joe Cassmassi		SCAQMD Staff
Jean Ospital		SCAQMD Staff
Carol Gomez		SCAQMD Staff
Chris Marlia		SCAQMD Staff
Sam Atwood		SCAQMD Staff
Michael Krause		SCAQMD Staff
Patti Whiting		SCAQMD Staff
Kevin Durkee		SCAQMD Staff

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 17

REPORT: Stationary Source Committee

SYNOPSIS: The Stationary Source Committee met Friday, January 23, 2015. Following is a summary of that meeting.

RECOMMENDED ACTION:
Receive and file.

Dennis Yates, Chair
Stationary Source Committee

MN:am

Attendance
The meeting began at 10:30 a.m. In attendance at SCAQMD Headquarters were Mayor Dennis Yates and Dr. Joseph Lyou. Mayor Ben Benoit attended via videoconference. Absent were Supervisor Shawn Nelson and Councilmember Judith Mitchell.

ACTION ITEMS

1. **Home Rule Advisory Group Membership Alternate**
   Dr. Joseph Lyou, as chair of the Home Rule Advisory Group, suggested this item be approved.

   Moved (Lyou), seconded (Benoit) and unanimously recommended for approval.

2. **Authorize Supplemental Funding for Norton Engineering**
   Joe Cassmassi, Planning and Rules Manager briefed the Committee on staff's request to amend the contract with Norton Engineering for $12,000 to provide supplemental analysis in support of the NOx RECLAIM rule amendment. He indicated that the task Norton Engineering will provide addresses disaggregation of confidential complex engineering cost analyses that will be forwarded to the refinery

stakeholders. This is a critical element in the rule development process. No comments were received from the committee or public.

Moved (Lyou), seconded (Benoit) and unanimously recommended for approval.

INFORMATIONAL ITEMS

3. Status Report on Reg. XIII – New Source Review

Mohsen Nazemi, Deputy Executive Officer of Engineering and Compliance, gave a presentation on the history and current status of the District's compliance with federal New Source Review (NSR) offset requirements. The presentation covered some of the history of the District's NSR Tracking and the current and projected balances, as well as the trends, of the District's internal offset accounts. Both the preliminary Calendar Year (CY) 2013 and the projected CY 2014-2015 federal offsets account balances are determined to remain positive thus indicating continued compliance with federal NSR offset requirements. Mr. Nazemi also explained that this is a preliminary determination of equivalency for CY 2013, and therefore includes only debits not credits, and that credits will be included in the final determination of equivalency for CY 2013, which will be presented to Stationary Source Committee in July 2014 and to the Governing Board in September 2015. Mayor Yates asked if the Native American Reservations are subject to NSR. Mohsen Nazemi and Barbara Baird explained that the Tribes are only subject to federal NSR and not state or local regulations. Ms. Baird also indicated that Morongo Tribal Land has already been re-designated by EPA to change the ozone major source thresholds from 10 tons per year to 25 tons per year, and Pechanga Tribe is also in the process of getting EPA approval to be re-designated so that the threshold will be 100 tons per year. There were no public comments or questions related to the presentation.

4. Update on Risk Management

Jill Whynot, Assistant Deputy Executive Officer of Engineering and Compliance, provided an update on efforts underway by CARB and CAPCOA to update Risk Management Guidelines that will cover permitting and the Air Toxics Hot Spots Program (AB2588). Updates are needed to reflect changes that the Office of Environmental Health Hazard Assessment (OEHHA) is making to risk assessment guidelines. The changes reflect new scientific information on childhood sensitivity and exposures, and will result in higher estimated cancer risks for residential exposures, even when emissions have not changed. Ms. Whynot explained the history of the existing guidance documents, some of the potential impacts of the changes, and the efforts underway to revise the guidelines. The objectives, public process, draft concepts and additional efforts that will be taken were described. SCAQMD staff has been evaluating district rules and programs and will bring a work plan to the Governing Board in March to outline what changes staff

recommends and the timeline to bring those items through a public process and to the Board for consideration.

Dr. Lyou commented that the draft risk management concepts do not include cancer burden. Mayor Yates asked about OEHHA's role and what happens at the federal level in similar programs. Dr. Lyou had several suggestions for the draft concept paper, including that there are many terms that should be better defined, that there should be equal risk protection regardless of which chemical is emitted, that due process is important so the public can have meaningful input on decisions, and that cumulative impacts are not considered in many of these programs. Staff will discuss these items with the CAPCOA and CARB group.

Curtis Coleman, Southern California Air Quality Alliance, asked if the dates for public workshops have been set, and how notification will be handled. Staff responded that the workshop dates have not been scheduled yet, and we will use many different mailing lists and websites to inform people. Vladimir Kogan from Orange County Sanitation District expressed concern about the increased number of facilities that may be required to do public notice. Frank Caponi from Los Angeles County Sanitation District stated that there is strong interest in this issue because there will be huge impacts to companies. The public process has not been inclusive so far and he would like to have more time and more public process for the state-wide and local district efforts.

WRITTEN REPORTS

All written reports were acknowledged by the Committee.

PUBLIC COMMENTS

There were no public comments. Mayor Yates announced that the next Stationary Source Committee meeting is scheduled for February 20, 2015 and adjourned the meeting at 11:25 a.m.

Attachment
Attendance Roster

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
STATIONARY SOURCE COMMITTEE
January 23, 2015
ATTENDANCE ROSTER (Voluntary)

NAME		AFFILIATION
Mayor Dennis Yates		SCAQMD Governing Board
Mayor Ben Benoit (VT)		SCAQMD Governing Board
Dr. Joseph Lyou		SCAQMD Governing Board
Mohsen Nazemi		SCAQMD staff
Jill Whynot		SCAQMD staff
Elaine Chang		SCAQMD staff
Barbara Baird		SCAQMD staff
Danny Luong		SCAQMD staff
Jean Ospital		SCAQMD staff
Joe Cassmassi		SCAQMD staff
Bill Wong		SCAQMD staff
Bay Gilchrist		SCAQMD staff
Tina Cox		SCAQMD staff
Kim White		SCAQMD staff
Bill Pearce		Boeing
Curtis Coleman		So. Cal. Air Quality Alliance
Bill LaMarr		California Small Business Alliance
Frank Caponi		LA County Sanitation District
Kris Flaig		LA County Sanitation District
David Rothbart		LA County Sanitation District
Vlad Kogan		Orange County Sanitation District
Rita Loof		RadTech

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 18

REPORT: Technology Committee

SYNOPSIS: The Technology Committee met on January 23, 2015. Major topics included Technology Advancement items reflected in the regular Board Agenda for the February Board meeting. A summary of these topics with the Committee's comments is provided. The next Technology Committee meeting will be on February 20, 2015.

RECOMMENDED ACTION:
Receive and file.

Dennis R. Yates
Acting Technology Committee Chair

MMM:pmk

Attendance: Mayor Dennis Yates, in attendance at District headquarters, chaired the meeting in Supervisor John Benoit's absence, and appointed Councilmember Michael Cacciotti as a one-time Committee Member for today's meeting. Councilmember Joe Buscaino participated by videoconference. Mayor Miguel Pulido was in attendance at SCAQMD headquarters. Councilmember Judith Mitchell was absent.

FEBRUARY BOARD AGENDA ITEMS

1. **Recognize Funds, Adopt Resolution to Extend Caltrans Grant Agreement, and Execute and Amend Contracts**
   On February 7, 2014, the Board recognized EPA funds for diesel emissions reduction projects under the Diesel Emissions Reduction Act (DERA). This action is to recognize $110,627 in additional Fiscal Year 13 (FY13) DERA funds into the Lower-Emission School Bus Fund (33) and execute contracts totaling $825,000 from the Lower-Emission School Bus Fund (33) to replace diesel school buses with electric buses. This action is also to adopt a resolution to extend a Caltrans grant agreement and amend contracts to reallocate unused funds for replacement of heavy-duty diesel trucks with CNG trucks totaling $350,000 from the Proposition 1B-

Goods Movement Program Fund (81). Finally, this action is to execute and amend contracts at no additional cost under the Proposition 1B and Carl Moyer Programs.

Staff commented that Wells Fargo Equipment changed their preference and now prefers purchase option over lease-to-own option for the truck replacement program. As such, staff concluded not to move forward with the Recommended Action to execute a contract with Wells Fargo Equipment and will revise the Board Letter accordingly.

Mayor Pulido asked about the range of the electric buses. Staff indicated that the range is between 80 and 120 miles. Councilmember Cacciotti asked for the cost of electric versus CNG buses supported by SCAQMD, and the cost of ownership over the life of an electric bus. Staff responded that the cost of a school bus is $260,000 for Type C electric bus, $176,000 for Type D CNG bus, $125,000 for a Type C diesel bus, and $148,000 for a Type D diesel bus. In addition, staff experience on commercial electric buses is limited given that only a few of the buses are being operated by school districts. Staff will be collecting such information to help determine actual operating cost to end users.

Mayor Pulido requested that in addition to the total cost of ownership, staff should also include the health impacts of a diesel bus compared to an electric bus. Staff agreed to incorporate this information.

Councilmember Buscaino asked whether staff have an inventory of buses across school districts in the area represented by SCAQMD, and whether the information is accessible to the general public. Staff responded that although a survey was conducted in 2012, staff will provide the data to the committee.

Moved by Pulido; seconded by Cacciotti; unanimously approved.

2. Execute Contracts for Advanced Optical Remote Sensing Technologies at Refineries, Other VOC Sources and Marine Vessels

Recent advances in optical remote sensing (ORS) technology have made it possible to quantify fugitive emissions from an entire refinery complex and other sources. In September 2014, an RFP was issued to conduct a series of measurements intended to fully characterize and quantify fugitive and stack emissions from large refineries, other important VOC sources and marine vessels and to develop remote sensing technologies with the intent of providing real-time data capability. Several proposals were received from different contractors and evaluated to select the most competitive bids. This action is to execute contracts with multiple contractors employing a variety of different advanced ORS technologies in an amount not to exceed $1,100,805 from the Rule 1118 Mitigation Fund (54).

Mayor Yates asked if refinery emission measurements could fluctuate with time and be impacted by variable meteorological conditions. Staff replied saying that although the proposed study will be conducted in September/October 2015 (when weather conditions are typically ideal for these types of measurements) previous studies have shown that refinery-wide emissions of VOCs do not vary substantially throughout the year. Councilmember Cacciotti asked about the dimensions and principle of operation of the instruments that will be used to conduct Projects 1 through 3. Staff explained that all of these devices will be either mounted on a van to take mobile measurements or placed at the refinery fence-line for upwind and downwind measurements. Staff also clarified that refinery emissions will be estimated by combining optical remote sensing and wind profile data.

Moved by Pulido; seconded by Cacciotti; unanimously approved.

3. Recognize Funds and Execute Contract for Heavy-Duty Advanced Technology Assessment

NOx emissions from on-road heavy-duty diesel trucks are the largest contributor to ozone and fine particulate air quality in the South Coast Air Basin. As such, there is a need to better understand and plan for the deployment of zero and near-zero emission advanced technologies in this sector. The Southern California Gas Company (SoCalGas) has expressed interest in cofunding a study that would help achieve this objective. This action is to recognize $250,000 from SoCalGas into the Clean Fuels Fund (31). This action is to also execute a contract with U.S. DOE's National Renewable Energy Laboratory to develop a detailed technology and economics-based assessment for the deployment of advanced heavy-duty vehicle technologies suitable in commercial fleet applications in an amount not to exceed $500,000 from the Clean Fuels Fund (31).

Mayor Pulido asked for the NOx emissions contributions to the inventory by heavy-duty diesel vehicles, locomotives, and ships. Staff responded that heavy-duty diesel vehicles, ships, and locomotives contribute 15 percent, 13 percent, and 7 percent, respectively, to the emissions inventory. In addition, it was indicated that a chart in the 2012 AQMP shows heavy-duty diesel trucks as the number one contributor to the NOx emissions inventory, marine vessels as the number three contributor, locomotives as the number five contributor, airplanes as the number six contributor, and RECLAIM sources as the number four contributor to the NOx emissions inventory.

Moved by Pulido; seconded by Cacciotti; unanimously approved.

4. Execute and Modify Contracts for Hydrogen Station Upgrades and Related Work

In March and September 2014, the Board approved contracts for hydrogen station upgrades in the South Coast Air Basin. While these stations are being upgraded, the equipment must be taken out of service. To continue to provide hydrogen fuel to customers at these stations and others that may be upgraded, CEC through PON 13-607 provided $999,677 to develop and deploy a commercial mobile hydrogen fueler at stations going offline for the equipment upgrade transition. This action is to cofund development and demonstration of the commercial mobile hydrogen fueler up to $200,000 from the Clean Fuels Fund (31). This action is also to modify a previous award for Mebtahi's hydrogen station upgrade to add $300,000 from the Hydrogen Fueling Infrastructure Network Fund (63). Finally, a contract modification is required to add $50,000 from the Hydrogen Fueling Infrastructure Network Fund (63) to evaluate upgraded hydrogen equipment.

This item was pulled by staff.

5. Other Business

In response to questions by Councilman Cacciotti, staff provided updates on the heavy-duty catenary truck project in Carson, the NG police cruiser RFP, and the commercial lawn and garden loaner program. All of the projects are in various stages of progress.

6. Public Comment Period

There was no public comment.

Next Meeting: February 20, 2015

Attachment

Attendance

Attachment A – Attendance

Councilmember Joe Buscaino	SCAQMD Governing Board (via VT)
Councilmember Michael Cacciotti	SCAQMD Governing Board
Mayor Miguel Pulido	SCAQMD Governing Board
Mayor Dennis Yates	SCAQMD Governing Board
Mark Abramowitz	Board Consultant (Lyou)
Bob Ulloa	Board Consultant (Yates)
John Olvera, Principal Deputy District Counsel	SCAQMD
Matt Miyasato, STA	SCAQMD
Henry Hogo, STA	SCAQMD
Fred Minassian, STA	SCAQMD
Laki Tisopulos, STA	SCAQMD
Randall Pasek, STA	SCAQMD
Andrea Polidori, STA	SCAQMD
Dean Saito, STA	SCAQMD
Mark Coleman, STA	SCAQMD
Drue Hargis, STA	SCAQMD
Lisa Mirisola, STA	SCAQMD
Adewale Oshinuga, STA	SCAQMD
Naveen Berry, PRDAS	SCAQMD
Olga Pikelnaya, PRDAS	SCAQMD
Robert Paud, IM	SCAQMD
Isabel Aguilar, STA	SCAQMD
Pat Krayser, STA	SCAQMD
Danielle Robinson	ARB
Susan Stark	Tesoro

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 19

REPORT: Mobile Source Air Pollution Reduction Review Committee

SYNOPSIS: Below is a summary of key issues addressed at the MSRC's meeting on January 15, 2015. The next meeting is scheduled for Thursday, February 19, 2015, at 2:00 p.m., in Conference Room CC8.

RECOMMENDED ACTION:
Receive and file.

Michael D. Antonovich
SCAQMD Representative on MSRC

MMM:HH:AP

Meeting Minutes Approved
The MSRC unanimously approved the minutes from its November 20, 2014 meeting. Those approved minutes are attached for your information *(Attachment 1)*.

FYs 2012-14 Alternative Fuel School Bus Incentives Program
As part of the FYs 2012-14 Work Program, the MSRC allocated $2.0 million for the implementation of an Alternative Fuel School Bus Incentives Program. The MSRC previously deemed A-Z Bus Sales qualified for Program participation and authorized them to offer buy-down incentives to qualifying school districts or private providers of pupil transportation. The MSRC approved an initial award to A-Z Bus Sales in December 2013, and in subsequent actions the MSRC approved contract value increases to incentivize additional buses ordered. In January, the MSRC approved a new request from A-Z Bus Sales for an additional $45,000 to incentivize five Type C propane school buses ordered by Anaheim Union High School District, as part of the FYs 2012-14 AB 2766 Discretionary Fund Work Program. This award will be considered by the SCAQMD Board at its February 6, 2015 meeting.

FYs 2012-14 Alternative Fuel Infrastructure Program
As part of the FYs 2012-14 Work Program, the MSRC allocated $7.5 million for the implementation of new and expanded CNG and LNG refueling stations and modification of maintenance facilities to accommodate gaseous-fueled vehicles. A Program Announcement, #PA2014-05, was developed and released on September 6, 2013, with an

open application period commencing October 8, 2013 and closing September 26, 2014. The MSRC previously considered 27 applications and awarded a total of $3,952,954 for those projects; one award for $175,000 was subsequently declined. Among the previously approved awards, Pomona Valley Transfer Station was awarded $150,000 to expand their existing public access CNG station. Subsequent to the approval, staff discovered that this project had been inaccurately described to both the MSRC and SCAQMD. The award amount was correct, but the recipient should have been listed as Grand Central Recycling and the project should have been described as the installation of a new public access CNG station. The MSRC approved the corrected award. The MSRC also considered three applications whose review had been extended, and approved three contract awards totaling $449,000 as part of the FYs 2012-14 AB 2766 Discretionary Fund Work Program, as follows:

a. A contract with City of Monterey Park in an amount not to exceed $225,000 for expansion of their existing CNG fueling station including public access;
b. A contract with Serv-Wel Disposal Services in an amount not to exceed $100,000 for installation of a new limited access CNG fueling station; and
c. A contract with West Covina Unified School District in an amount not to exceed $124,000 for expansion of their existing limited access CNG fueling station.

These awards will be considered by the SCAQMD Board at its February 6, 2015 meeting.

Exercise Second Two-Year Option for Website Services

Several years ago the MSRC created a website as a marketing and outreach tool as well as a source of information for its contractors and other interested entities. Following an open RFP process, the MSRC selected Mineral Studios to redesign, host and maintain the MSRC website. The contract effectuating the award, #MS11001, allows for up to two extensions of two years each, contingent upon allocation of funds by the MSRC and approval by the SCAQMD Governing Board. The cost proposal for the option periods was included in the original proposal, at a rate of $8,600 per year. Basic hosting and maintenance would cost $300 per month, with the remainder available for website revisions/upgrades if required and directed by the MSRC. The MSRC approved exercising the first option in February 2013. At their January 2015 meeting, the MSRC unanimously approved executing the second two-year option to extend Mineral's contract and augmented the contract with $17,200 as part of the FYs 2014-16 Work Program. This item will be considered by the SCAQMD Board at its February 6, 2015 meeting.

Received and Approved Final Reports

The MSRC received and unanimously approved two final report summaries this month as follows:

1. City of Redlands, Contract #MS11067, which provided $85,000 to expand an LCNG and LNG fueling station; and
2. KEC Engineering, Contract #MS11055, which provided $250,000 to repower five off-road heavy-duty vehicles.

Contract Modification Requests
The MSRC considered two contract modification requests and took the following unanimous actions:

1. For City of Los Angeles, Bureau of Sanitation, Contract #ML12017, which provides $950,000 towards the purchase of 32 heavy-duty natural gas vehicles, approval of an 18-month term extension; and
2. For Mike Diamond/Phace Management Services, Contract #MS12033, which provides $500,000 for the purchase of 20 medium heavy-duty CNG trucks, approval of a 30-month contract term extension, contingent upon ordering of the remaining 19 trucks by July 2, 2015.

Contracts Administrator's Report
The MSRC's AB 2766 Contracts Administrator provides a written status report on all open contracts from FY 2004-05 through the present. The Contracts Administrator's Report for January 2015 is attached *(Attachment 2)* for your information.

Attachments
Attachment 1 – Approved November 20, 2014 Meeting Minutes
Attachment 2 – January 2015 Contracts Administrator's Report

MOBILE SOURCE AIR POLLUTION REDUCTION REVIEW COMMITTEE
THURSDAY, NOVEMBER 20, 2014 MEETING MINUTES
21865 Copley Drive, Diamond, Bar, CA 91765- Conference Room CC-8

MEMBERS PRESENT:

(Vice Chair) Larry McCallon, representing SANBAG
Michael Antonovich, representing SCAQMD (via v/c)
Ben Benoit (Alt.), representing SCAQMD
Tim Shaw (Alt.) representing OCTA
Steve Veres, rep. LA County MTA (via v/c)
Greg Winterbottom, representing OCTA
Earl Withycombe, representing CARB

MSRC MEMBERS ABSENT:

April McKay (Alt.), representing LA County MTA
(Chair) Greg Pettis, rep. RCTC
Ron Roberts, representing SCAG

MSRC-TAC MEMBERS PRESENT:

(MSRC-TAC Chair) Gretchen Hardison, rep. City of Los Angeles (via v/c)
Kelly Lynn, representing San Bernardino Associated Governments
Dean Saito, representing SCAQMD
Andy Silva, representing San Bernardino County Board of Supervisors

OTHERS PRESENT:

Lauren Dunlap, Southern California Gas
Earl Elrod, SCAQMD Board Asst (Yates)
Debra Mendelsohn, SCAQMD Board Asst (Antonovich)
Jerry Pederson, A-Z Bus Sales
Ric Teano, OCTA

SCAQMD STAFF & CONTRACTORS

Ray Gorski, MSRC Technical Advisor-Contractor
Henry Hogo, Asst. DEO/Science & Technology Advancement
Matt MacKenzie, MSRC Contracts Assistant
Ana Ponce, MSRC Administrative Liaison
Cynthia Ravenstein, MSRC Contracts Administrator
Veera Tyagi, Senior Deputy District Counsel
Robert Paud, Telecommunications Technician II

CALL TO ORDER

- Call to Order

  MSRC Vice Chair Larry McCallon called the meeting to order at 2 p.m. in the absence of MSRC Chair Greg Pettis.

- Opening Comments:
  There were no opening comments.

PUBLIC COMMENT PERIOD

Public comments were allowed during the discussion of each agenda item. No comments were made on non-agenda items.

STATUS REPORTS

- Clean Transportation Policy Update
  Cynthia Ravenstein indicated that there is a handout of the Clean Transportation Policy Update available at the meeting today. She will be sending the MSRC members an electronic copy so that they may access all the links in the document. Some highlights include: In February, CARB will be considering re-adoption of the Low Carbon Fuel Standard and amendments to the ZEV regulation.

CONSENT CALENDAR (Items 1 through 9)
Receive and Approve Items
Agenda Item #1 – Minutes of the September 18 and October 16, 2014, MSRC Meetings

The minutes of September 18 and October 16, 2014, MSRC meetings were provided under separate cover and made available at today's meeting.

> ON MOTION BY MSRC MEMBER GREG WINTERBOTTOM, AND SECONDED BY MSRC MEMBER EARL WITHYCOMBE, UNDER APPROVAL OF CONSENT CALENDAR ITEMS 1 THROUGH 9, THE MSRC VOTED UNANIMOUSLY TO APPROVE THE SEPTEMBER 18 AND OCTOBER 16, 2014 MSRC MEETING MINUTES.

ACTION: Staff will place the approved minutes on the MSRC's website.

Agenda Item #2 – Summary of Final Reports by MSRC Contractors

Two final report summaries were included in the agenda package, as follows: 1) Southern California Regional Rail Authority, Contract #MS14047, which provided $49,203 towards the implementation of special Metrolink service to Auto Club Speedway; and 2) Nationwide Environmental Services, Contract #MS10006, which provided $94,887 towards the purchase of 3 sweepers equipped with advanced natural gas engines.

ON MOTION BY MSRC MEMBER GREG WINTERBOTTOM, AND SECONDED BY MSRC MEMBER EARL WITHYCOMBE, UNDER APPROVAL OF CONSENT CALENDAR ITEMS 1 THROUGH 9, THE MSRC VOTED UNANIMOUSLY TO APPROVE THE FINAL REPORTS ABOVE.

ACTION: MSRC staff will file the final reports and release any retention on the contracts.

Agenda Item #3 – Consider Adoption of 2015 Meeting Schedules

Annually the MSRC considers a proposed meeting schedule for the upcoming year. The schedule continues with meetings on the first and third Thursdays, respectively, for the MSRC-TAC and MSRC, with two exceptions. Staff recommends the MSRC-TAC meetings in January and December be held on the second Thursday of the month to avoid holiday conflicts.

ON MOTION BY MSRC MEMBER GREG WINTERBOTTOM, AND SECONDED BY MSRC MEMBER EARL WITHYCOMBE, UNDER APPROVAL OF CONSENT CALENDAR ITEMS 1 THROUGH 9, THE MSRC VOTED UNANIMOUSLY TO APPROVE THE ADOPTION OF THE 2015 MEETING SCHEDULE.

ACTION: Staff will place the adopted 2015 meeting schedule on the MSRC's website.

Receive and File Items
Agenda Item #4 – MSRC Contracts Administrator's Report

The MSRC AB 2766 Contracts Administrator's Report for September 25 through October 29, 2014, was included in the agenda package.

ON MOTION BY MSRC MEMBER GREG WINTERBOTTOM, AND SECONDED BY MSRC MEMBER EARL WITHYCOMBE, UNDER APPROVAL OF CONSENT CALENDAR ITEMS 1 THROUGH 9, THE MSRC VOTED UNANIMOUSLY TO RECEIVE AND FILE THE CONTRACTS ADMINISTRATOR'S REPORT FOR SEPTEMBER 25 THROUGH OCTOBER 29, 2014.

ACTION: SCAQMD staff will include the MSRC Contracts Administrator's Report in the MSRC Committee Report for the December 5, 2014 SCAQMD Board meeting.

Agenda Item #5 – Financial Report on AB 2766 Discretionary Fund

A financial report on the AB 2766 Discretionary Fund for the period ending October 31, 2014 was included in the agenda package.

ON MOTION BY MSRC MEMBER GREG WINTERBOTTOM, AND SECONDED BY MSRC MEMBER EARL WITHYCOMBE, UNDER APPROVAL OF CONSENT CALENDAR ITEMS 1 THROUGH 9, THE MSRC VOTED UNANIMOUSLY TO RECEIVE AND FILE THE FINANCIAL REPORT FOR THE PERIOD ENDING OCTOBER 31, 2014.

ACTION: No further action is required.

For Approval - As Recommended
Agenda Item #6 – Consider 18-Month Term Extension by Griffith Company, Contract #MS11092 ($390,521 – "Showcase II" Off-Road Vehicle Retrofit Demonstration Program)

Griffith Company requests an 18-month extension due to personnel changes at the device manufacturer, Nett Technologies. The MSRC-TAC unanimously recommends approval.

ON MOTION BY MSRC MEMBER GREG WINTERBOTTOM, AND SECONDED BY MSRC MEMBER EARL WITHYCOMBE, UNDER APPROVAL OF CONSENT CALENDAR ITEMS 1 THROUGH 9, THE MSRC VOTED UNANIMOUSLY TO APPROVE AN 18-MONTH CONTRACT TERM EXTENSION TO GRIFFITH COMPANY, CONTRACT #ML11092, AS PART OF THE FY 2010-11 OFF-ROAD DIESEL CONSTRUCTION EQUIPMENT RETROFIT "SHOWCASE II" PROGRAM.

ACTION: MSRC Staff will amend the above contract accordingly.

Agenda Item #7 – Consider Modified Scope of Work and Reduced Contract Value by City of San Fernando, Contract #ML14062 (proposed) ($500,000 – Install New CNG Station)

The City requests to substitute the expansion of their existing CNG station for the installation of a new station, with an associated $112,909 award value reduction. The MSRC-TAC unanimously recommends approval.

ON MOTION BY MSRC MEMBER GREG WINTERBOTTOM, AND SECONDED BY MSRC MEMBER EARL WITHYCOMBE, UNDER APPROVAL OF CONSENT CALENDAR ITEMS 1 THROUGH 9, THE MSRC VOTED UNANIMOUSLY TO APPROVE THE CITY OF SAN FERNANDO'S REQUEST TO SUBSTITUTE THE EXPANSION OF THEIR EXISTING CNG STATION FOR THE INSTALLATION OF A NEW STATION, WITH AN ASSOCIATED $112,909 AWARD VALUE REDUCTION, CONTRACT #ML14062 (PROPOSED), AS PART OF FYS 2012-14 LOCAL GOVERNMENT MATCH PROGRAM.

ACTION: MSRC Staff will amend the above contract accordingly.

Agenda Item #8 – Consider 24-Month Term Extension by Ware Disposal Co., Inc., Contract #MS12034 ($133,070 – Purchase 8 Medium-Heavy Duty Vehicles)

Ware Disposal Co., Inc., requests a 24-month extension to complete their vehicle purchases. The MSRC-TAC unanimously recommends approval.

> ON MOTION BY MSRC MEMBER GREG WINTERBOTTOM, AND SECONDED BY MSRC MEMBER EARL WITHYCOMBE, UNDER APPROVAL OF CONSENT CALENDAR ITEMS 1 THROUGH 9, THE MSRC VOTED UNANIMOUSLY TO APPROVE A 24-MONTH CONTRACT TERM EXTENSION FOR WARE DISPOSAL CO., INC., CONTRACT #MS12034, AS PART OF FYS 2012-14 LOCAL GOVERNMENT MATCH PROGRAM.

ACTION: MSRC staff will amend the above contract accordingly.

Agenda Item #9 – Consider Potential Upgrades to MSRC Website by Mineral LLC under Contract #MS11001 ($111,827 – Design, Host & Maintain MSRC Website)

The MSRC website's current notification service sends an e-mail message to subscribers when a new agenda is posted. The MSRC-TAC Administrative Subcommittee considered options to enhance the functionality of the service and recommends the creation of a new mailing list for meeting changes. Customized e-mails could be sent to highlight meeting time and/or location changes, as well as any cancellations. Mineral LLC, the company which maintains the site under Contract #MS11001, estimates the cost to add this feature from $3,000 to $3,750. The Administrative Subcommittee recommends the issuance of the Task Order for this work. Sufficient funds are available in the contract. The MSRC-TAC unanimously recommends approval.

> ON MOTION BY MSRC MEMBER GREG WINTERBOTTOM, AND SECONDED BY MSRC MEMBER EARL WITHYCOMBE, UNDER APPROVAL OF CONSENT CALENDAR ITEMS 1 THROUGH 9, THE MSRC VOTED UNANIMOUSLY TO APPROVE THE ISSUANCE OF A TASK ORDER FOR MINERAL LLC, UNDER CONTRACT #MS11001, TO UPGRADE MSRC WEBSITE, AT A COST NOT TO EXCEED $3,750.

ACTION: MSRC staff to issue task order to Mineral LLC.

ACTION CALENDAR (Items 10 through 14)
FYs 2014-16 Work Program
Agenda Item #10 – MSRC Discussion/Action Items/Next Steps *(Continued from the October 2014 MSRC Meeting)*

Ray Gorski, MSRC Technical Advisor, reported that at the last meeting there was an initial discussion as to the next steps in developing the MSRC's FYs 2014-16 Work Program. Due to time considerations, it was decided that that would be continued to this month. The process is to allocate funds for programs. The total unallocated budget at this

time is estimated to be on the order of $45 million. This is a two-year Work Program. Included in the agenda package, for the MSRC's reference, is a presentation that was made at the last meeting. At that time there was some discussion about providing the TAC with direction to initiate the development of items which have broad-based support and then presenting the Work Program in a manner in which those programs are done first and then, as other opportunities present themselves, the MSRC would take those under consideration. At this point, staff will take whatever guidance the MSRC provides today and move forward as appropriate.

[MSRC Member Michael Antonovich arrived at 2:10 p.m. A quorum was already present.]

MSRC Member Earl Withycombe stated that, in looking at what Ray Gorski has proposed, he can support the priorities listed, which include moving forward initially with Local Match, Event Center, and Infrastructure Programs, as well as a broad-based TCM category. He would ask, however, for the Committee to consider opportunities for add-ons on some of these programs. Considering the comments that came in from the stakeholder workshops, one idea is to include EV charging stations which are probably the largest area where the MSRC is going to allocate funds to zero-emission technologies, for which he was previously advocating. A second idea is that if the MSRC allocates funds that will be used broadly for TCMs, it might include bike infrastructure, and in any bike infrastructure program, he would suggest to add points of priority to projects that would add parking infrastructure, bike racks facilities, and that the MSRC make sure that there are bike lanes accessing all those dollars that the MSRC puts in non-roadway improvements. He also suggests that the MSRC provide emphasis for the low-cost bike lanes, which are simply class-three striped bike lanes, as opposed to giving points for class-one separated pathways which are more expensive. Those are his thoughts about additional instructions to give staff to consider in moving forward with Ray Gorski's basic program. At this time, he doesn't have any unique program ideas to plug into the space where the MSRC may have available funding, but these items could be discussed among themselves, or be brought back at a later date.

MSRC Member Greg Winterbottom agreed with Mr. Withycombe in that staff probably has the best idea, maybe even working with SCAQMD and CARB, of what the MSRC can do and then the MSRC can fill that gap. He indicated that he didn't have any ideas off the top of his head. He suggested looking to the staff for ideas that would help the MSRC dig deeper than where they have been.

MSRC Vice Chair Larry McCallon likes the idea of tying active transportation in. One of the issues in San Bernardino County is looking at interconnectivity between rail and buses and providing access at the transit stations to bicycles, etc., for first-mile, last mile. That whole connectivity issue is to make it more convenient for people to use transit and get them off the road. If the MSRC can, we ought to try to support that.

[MSRC Member Steven Veres arrived at 2:12 p.m.]

Mr. Gorski indicated that, as of today, with MSRC-TAC Chair Gretchen Hardison participating, staff will begin the process of forming the TAC Subcommittees to actually

do the heavy lifting on developing these programs. Some of these will have a good start because of past successes. Staff and the TAC Subcommittees have the obligation to go through and make sure that any modifications that are deemed appropriate are made, but that will be done in a timely manner. They will be working with the stakeholders who are advocating those programs and develop opportunities for the MSRC's consideration probably no later than the January meeting; at least to get a substantial portion of the work program underway.

When asked what is new on the horizon, Mr. Gorski replied that there are initiatives which are being put forth by both CARB, as well as SCAQMD specifically looking at moving toward zero-emissions for goods movement. There are other funding opportunities but as has been discussed in the past, there might be a role for the MSRC to partner with the state agencies as well as the local air district to accelerate the deployment of zero emission technologies, especially those that are applicable to goods movement. That is something which is a little different than the MSRC has done in the past but again it is an initiative that is being implemented at all levels within California.

The ports have adopted their Clean Air Action Plans and are currently implementing them. One thing to remember about Goods Movement is that it stretches not only at the ports but all the way to the Inland Empire where many of the warehouse distribution centers are located and they have the same issues related to goods movement that the ports have relative to ensuring that they are moving goods in as clean a method as possible. The SCAQMD has indicated on many occasions the need to move those toward zero emissions because of the ozone obligations relative to 2023 and 2032.

Mr. Gorski said that there is a lot of work to be done in goods movement and zero emissions. One item MSRC Member Earl Withycombe mentioned is the enabling infrastructure. It is hard to have a bunch of plug in vehicles if there is no infrastructure to support them. The MSRC has often times in the past stood up and been the body which helps with the enabling technologies to allow other clean air strategies to be feasible. There is going to be a fair amount of consideration given, and of course, active transportation is something which the MSRC has done in the past, but there will be a more coordinated effort for active transportation in this work program. While the MSRC will most likely see some of the programs which have become somewhat institutionalized over the years, the Local Match Program, the Infrastructure Program to support natural gas vehicles, the programs that support Event Center Transportation, they will also most likely see an emphasis now to look at zero emissions good movement, look at active transportation, which cover both ends of the spectrum, as well as anything else that presents itself. It is going to be a robust program. With $45 million, there are a lot of opportunities. He does not foresee leaving too much money on the table because there are a lot of expressed needs. Working with the CARB, SCAQMD, and the MSRC and TAC staff will go through and identify other programs which are meritorious for example those which were put forth at the recent workshops. There is a lot of work to do but he believes that they will have something put together to start debating as early as January.

Vice Chair Larry McCallon asked if it was the consensus of the committee to move forward. There were no objections. Mr. Withycombe recommended to take Ray Gorski's

list of priorities, which are on the last two pages of the proposal, and start work on that basis.

Agenda Item #11 – Consider Partnership with SCAQMD on Implementation of AB118 Enhanced Fleet Modernization Program (EFMP)

Ray Gorski, MSRC Technical Advisor, reported that this item is an opportunity being presented from the SCAQMD to partner on a program that would allow low and middle income consumers to scrap their older high emitting vehicles and provide a replacement voucher to purchase a cleaner newer vehicle or receive a voucher for an equivalent valued transit pass. The SCAQMD has put together a PowerPoint presentation for the MSRC's consideration. This item was heard at the MSRC-TAC. It was approved, but not unanimously.

Henry Hogo, Assistant DEO/Science and Technology Advancement, reported that the Enhanced Fleet Modernization Program (EFMP) is a state program. Recently, there has been a lot of attention by the State Legislature to develop a program that targets low and middle income consumers to offer incentives to replace their older high emitting vehicles with newer, more fuel efficient and cleaner technology vehicles. The focus of the legislature has also been directed at disadvantage communities and ensuring that program implementation be focused in disadvantage communities. In addition the legislation has allowed for substitution of the face value of the voucher to go towards transit passes, vanpooling, or car sharing. Such flexibility will help implement SB375 in terms of having more people taking transit and reducing congestion. This is an ideal program for the MSRC to partner with because the goals and objectives of the MSRC in reducing emissions and reducing congestion really fit together with this program. The SCAQMD is one of two Districts that will receive moneys from the State to implement the program, however funding would not be coming until the spring of 2015. With the interest from the Legislature and the Governor's Office, to see a successful implementation there is a need to begin the program as early as possible. SCAQMD is moving forward with the program and taking a Board Item before its Technology Committee tomorrow and full Governing Board on December 5th. The Governing Board will be asked to make awards to four proposals to move ahead with the program will a special focus for outreach and marketing to low and middle income consumers living in disadvantage communities. The funding amount being program will do between 373 to 672 vouchers depending upon the amount of the vouchers and the consumers income levels.

Because of concerns with consumer protection and the financing for lower income households, most likely there would be a need to work with financial institutions that do these types of auto loans. If a consumer decides to go with a voucher for an automobile, they will work with these financial institutions and the voucher will go towards that loan. Because these financial institutions have been working with low income consumers they have a defined interest rate, unlike auto dealerships where they have their own financing if a consumer is a higher risk applicant.

Discussions have been held with Omnitrans, OCTA, and Metro about the EFMP program. Their transit pass programs are either run by themselves or a third party regional transit pass agency. Either the SCAQMD or one of its contractors will work with the transit

agencies or a third party regional transit pass agency to work out the details of issuing transit passes in lieu of vouchers for equivalent value of the vouchers. For car sharing programs, two vanpool entities have already identified that do regional vanpooling and discussions are being held with them about how they can participate in the program.

Several pieces of the program are being aligned and due to the nature of the program the SCAQMD would like to have more funding into the program initially to get things going. Therefore, they are requesting that the MSRC consider putting in $800,000, of which $200,000 would go towards administering one of these contracts and $600,000 would be for vouchers.

MSRC Member Larry McCallon questioned why the TAC vote was not unanimous in their decision to recommend moving this forward. Mr. Hogo replied that the discussion was not about the merits of the program rather that the timing preceded the development of the work program. He mentioned that MSRC Member Earl Withycombe was present at the TAC meeting. Mr. Withycombe commented that it was probably because of concerns that he had expressed with respect to this proposal when it came to the TAC. He similarly raised the same reservations when the RCTC proposal came to the TAC two months earlier for an early carve out from the MSRC budget before they had had any subsequent discussions, that gave him pause with respect to the program. In the two weeks since the TAC meeting, he had conversations with a number of folks. Mr. Withycombe now feels that he has a much better understanding of the financial cost of commitments that are being looked at with Ray Gorski's proposal which by consensus passed the TAC and his reservations about premature timing of introduction are now resolved. Because of that he is now prepared to support the proposal.

Mr. Hogo said that there is another program called EFMP Plus-Up. The Plus-Up is part of the AB32 program utilizing Cap and Trade funds. The focus of this program will be residents living in disadvantaged communities. Residents meeting the income qualifications and living in disadvantaged communities can receive an additional $5,000 on top of the $4,500 being offered in the base EFMP program. MSRC-TAC Member Dean Saito cited that the distinction between the EFMP Plus Up is that the additional $5,000 combined with the EFMP $4,500 can go toward a used car. The anticipated number of used vehicles becoming available from lease programs of battery electric, plug-in hybrid, and conventional hybrids would make such vehicles eligible for the EFMP Plus Up. A consumer can be eligible to buy a used advanced technology vehicle at a much discounted rate and get up to $9,500 to scrap their vehicle and replace it with an advanced technology vehicle.

Mr. Winterbottom asked if there is a length of ownership required? Mr. Hogo replied that that is being looked into. There will be some commitment on having that car stay in operation for two or three years. Mr. Winterbottom asked about the previous car that is being turned in. Mr. Saito said that the there will be a requirement to show some indication that it has been registered for at least two-years; and the vehicle has to be operational.

Mr. Winterbottom asked how many people will be getting these benefits. Mr. Hogo replied that the state is offering to give SCAQMD up to $1.4 million. The Governing Board will be asked to use local money from the SCAQMD side of $1.025 million to kick start the program; and the MSRC is being asked for $800,000. The total number of vehicles scrapped and replaced would be 992, at the lowest voucher face value; and the highest voucher level would be somewhere around 550 vehicles.

Mr. Winterbottom asked if the voucher offer is per person, or per family. Mr. Saito replied that it is per person, for a two-year period. He was not sure if they will get into that level of distinction, household or per person. Mr. Hogo added that the federal poverty level per household will be used.

Mr. Hogo stated that students may be prime focus time for this program, especially students who go to colleges in the inner city core. A lot of the transit agency focus is on having students take transit more so than driving.

> ON MOTION BY MSRC MEMBER GREG WINTERBOTTOM, AND SECONDED BY MSRC MEMBER EARL WITHYCOMBE, THE MSRC UNANIMOUSLY APPROVED AN ALLOCATION OF $800,000 TO AUGMENT THE SCAQMD FUNDS TO IMPLEMENT THE ENHANCED FLEET MODERNIZATION PROGRAM.
> AYES: ANTONOVICH, VERES, WINTERBOTTOM, WITHYCOMBE, MCCALLON.
> NOES: NONE.

ACTION: Staff will include this item for consideration by the SCAQMD Board at its December 5, 2014 meeting.

FYs 2012-14 Work Program
Agenda Item #12 – Consider Funding for Applications Received under the Alternative Fuel Infrastructure Program

Cynthia Ravenstein, MSRC Contracts Administrator, presented this item on behalf of the Infrastructure Subcommittee Chair, A.J. Marquez, who was unable to attend the meeting. MSRC released a program announcement for $7.5 million available in funding for alternative fuel infrastructure, specifically looking at CNG and LNG stations and modifications to maintenance facilities. The MSRC has already made a number of awards under this program, however, as it was coming to a close, there were 15 additional applications received. The Infrastructure Subcommittee has been reviewing these applications. There are a number of issues that need to be resolved on many of them, but at this time the TAC is recommending 12 of the 15 applications. The remaining three are still being evaluated. It is not that there is necessarily any recommendation not to fund those, but those will be coming back to the MSRC in the near future. At this time, there is a recommendation to fund 12 applications totaling $2,049,954. There are a variety of different types of projects: some new stations, some expansions, some public, some limited access, and a few maintenance facility modifications.

Veera Tyagi, Senior Deputy District Counsel, stated that MSRC Member Michael Antonovich does not have a financial interest but is required to identify for the record that he is a member of the Board of Directors for the Los Angeles County Sanitation District, which is involved in the item.

> ON MOTION BY MSRC MEMBER EARL WITHYCOMBE AND SECONDED BY MSRC MEMBER GREG WINTERBOTTOM, THE MSRC UNANIMOUSLY APPROVED 12 APPLICATIONS FOR $2,049,954 IN TOTAL FUNDING; AS PART OF THE FYS 2012-14 WORK PROGRAM.
> AYES: ANTONOVICH, VERES, WINTERBOTTOM, WITHYCOMBE, MCCALLON.
> NOES: NONE.

Agenda Item #13 – Consider Funding for Proposals Received under the Major Event Center Transportation Program

MSRC-TAC Member Kelly Lynn, Chair/TCM Subcommittee, indicated that at the close of the FYs 2012-14 Work Program, they also received three proposals: One from OCTA for the Angels Express project which involves some dedicated rail service for the 48 Angels home games; one from the Auto Club Speedway for the NASCAR Race in March; and one from the Los Angeles County Fair, in partnership with Foothill Transit.

The Angels Express project would provide dedicated Metrolink rail service on the Orange County line for 48 Angels home games, as well as providing service on another dedicated line for the Inland Empire for the Friday home games. The Auto Club project would also provide dedicated service, in this case out of Oceanside, Oxnard and Lancaster. Both of these dedicated rail services will get people to the events; and they will wait, even if there are extra innings. Both of those were recommended for approval by the TAC.

Regarding the Los Angeles County Fair proposal, that one was in partnership with Foothill Transit asking for $500,000 for the construction of a multi-modal transit center. That was not the idea behind this particular Program. This grant is for the reduction of congestion around large events and to try to get people to try alternative modes and not to drive into these large events in single-occupancy vehicles but to try rail or transit or buses. Therefore, the thought in reviewing the Los Angeles County Fair proposal was that maybe they didn't quite understand because it was their first submittal. Therefore, the Subcommittee did not recommend it. MSRC staff followed up with the L.A. County Fair afterwards and explained the reasoning, and they understood.

Ms. Ravenstein added that staff is going to work with them, if indeed the MSRC has another Major Event Center Transportation Program. The parameters of the program could end up changing somewhat, but even if it stays the same as it was previously, staff could work with them to see if there is a way to come up with something that fits the parameters.

MSRC Member Steve Veres moved the item but suggested that staff go over the actual parameters with the L.A. Fair because they are certainly identifying an interest and probably a need for being involved in a program like this. If staff can provide direct feedback to them on why they were not funded this time around, but perhaps they can consider a modification for the future, or the MSRC can consider something different in the future.

> ON MOTION BY MSRC MEMBER STEVE VERES, AND SECONDED BY MSRC MEMBER EARL WITHYCOMBE, THE MSRC UNANIMOUSLY APPROVED AN AWARD TO OCTA IN THE AMOUNT OF $239,645 TO IMPLEMENT THE 2015 SEASON OF THE ANGELS EXPRESS METROLINK SERVICE; AND AN AWARD TO SCRRA ON BEHALF OF THE AUTO CLUB SPEEDWAY IN THE AMOUNT OF $83,960 TO IMPLEMENT SPECIAL METROLINK SERVICE IN SUPPORT OF THE 2015 AUTO CLUB 400 RACE, AS PART OF THE FYS 2012-14 WORK PROGRAM.
> AYES: ANTONOVICH, VERES, WINTERBOTTOM, WITHYCOMBE, MCCALLON.
> NOES: NONE.

MSRC Member Earl Withycombe indicated that his understanding from the package is that there was no allowance in the solicitation for construction costs, and that was the primary reason that it couldn't be accepted. He assumed that the TAC will take the information they learned from the L.A. Fair and make sure that they can structure their proposal in the upcoming round for the 2014-16 Event Center grant program so that they will be eligible.

Veera Tyagi, Senior Deputy District Counsel, stated for Supervisor Antonovich, Vice Chair McCallon, and MSRC Member Greg Winterbottom, that these members do not have a financial interest in the matter, but Supervisor Antonovich, and Mayor Pro Tem McCallon are members of the Southern California Regional Rail Authority, and Member Winterbottom is a member of OCTA, and they are required to make that disclosure for the record.

Mr. Veres asked that if the Angels or Dodgers go into the playoffs, is there enough funds to facilitate an extension to continue the program into the playoffs. These types of programs would get a lot of attention. The reply was yes. Ms. Ravenstein added that for 2013 Metro did come in and request additional funding that the MSRC did grant for the playoffs.

Agenda Item #14 – Consider Contract Value Increase by BusWest, Contract #MS14048 ($444,850 with pending increase to $909,850 – Incentives for Alternative Fuel School Buses)

Cynthia Ravenstein, MSRC Contracts Administrator, reported that this request comes from one of the qualified vendors for the Alternative Fuel School Bus Incentives Program. BusWest received a purchase order from Banning Unified School District for one full-size CNG school bus. As the funding in BusWest's contract has already been expended,

or already had other purchase orders against it, they have requested a $31,000 increase. The TAC recommends approval. There is plenty of funding left out of what the MSRC allocated.

ON MOTION BY MSRC MEMBER EARL WITHYCOMBE, AND SECONDED BY MSRC MEMBER GREG WINTERBOTTOM, THE MSRC UNANIMOUSLY APPROVED A $31,000 CONTRACT VALUE INCREASE TO BUSWEST AS PART OF THE FYS 2012-14 ALTERNATIVE FUEL SCHOOL BUS INCENTIVES PROGRAM.
AYES: ANTONOVICH, VERES, WINTERBOTTOM, WITHYCOMBE, MCCALLON.
NOES: NONE.

OTHER BUSINESS
Agenda Item #15 – Other Business

- Ray Gorski asked whether the MSRC believes there is a need to have a meeting in December. Oftentimes, if there is a light agenda, or if there are no urgent items, the MSRC chooses to not have a December meeting. The MSRC, therefore, chose not to meet in December.

ADJOURNMENT

THERE BEING NO FURTHER BUSINESS, THE MSRC MEETING ADJOURNED AT 3:08 P.M.

NEXT MEETING:

Thursday, January 15, 2015, at 2 p.m., Room CC-8.

[Prepared by Ana Ponce]

Clean Transportation
Funding from the MSRC
Mobile Source Air Pollution Reduction Review Committee

MSRC Agenda Item No. 3

DATE: January 15, 2015

FROM: Cynthia Ravenstein

SUBJECT: AB 2766 Contracts Administrator's Report

SYNOPSIS: This report covers key issues addressed by MSRC staff, status of open contracts, and administrative scope changes from October 30 through December 31, 2014.

RECOMMENDATION: Receive and file report

WORK PROGRAM IMPACT: None

Contract Execution Status

2012-14 Work Program

On April 5, 2013, the SCAQMD Governing Board approved three awards under the Event Center Transportation Program. These contracts are undergoing internal review or executed.

On July 5, 2013, the SCAQMD Governing Board approved an additional award to Orange County Transportation Authority under the Event Center Transportation Program. This contract is executed.

On September 6, 2013, the SCAQMD Governing Board approved an award to Transit Systems Unlimited under the Event Center Transportation Program. This contract is executed.

On November 1, 2013, the SCAQMD Governing Board approved two awards under the Event Center Transportation Program. These contracts are executed.

On December 6, 2013, the SCAQMD Governing Board approved 25 awards under the Local Government Match Program, 12 awards under the Alternative Fuel Infrastructure Program, one award under the Alternative Fuel School Bus Incentives Program, and one award under the Event Center Transportation Program. These contracts are awaiting responses from the prospective contractor, undergoing internal review, with the SCAQMD Board Chair for signature, or executed.

On January 10, 2014, the SCAQMD Governing Board approved three awards under the Local Government Match Program, one award under the Alternative Fuel Infrastructure Program, and

MSRC Database
Mobile Source Air Pollution Reduction Review Committee

AB2766 Discretionary Fund Program Invoices

October 30, 2014 to December 31, 2014

Contract Admin.	MSRC Chair	MSRC Liaison	Finance	Contract #	Contractor	Invoice #	Amount
2009-2010 Work Program							
11/20/2014	11/20/2014	11/21/2014	11/21/2014	MS10006	Nationwide Environmental Services	Final	$9,488.70
Total: $9,488.70							
2010-2011 Work Program							
12/26/2014				MS11001	Mineral LLC	100837	$300.00
12/3/2014	12/18/2014	12/19/2014	12/19/2014	ML11034	City of Los Angeles, Department of General Ser	FINAL	$630,000.00
11/20/2014	11/20/2014	11/21/2014	11/21/2014	MS11001	Mineral LLC	100805	$300.00
Total: $630,600.00							
2011-2012 Work Program							
11/7/2014	11/20/2014	11/21/2014	11/21/2014	ML12022	City of La Puente	14-13	$60,000.00
Total: $60,000.00							
2012-2014 Work Program							
12/16/2014	12/18/2014	12/19/2014	12/19/2014	MS14048	BusWest	BW005504	$31,000.00
11/7/2014	11/20/2014	11/21/2014	11/21/2014	MS14047	Southern California Regional Rail Authority (Metr	.001154 Fina	$32,067.04
10/31/2014	10/31/2014	10/31/2014	11/5/2014	MS14003	Orange County Transportation Authority	AR136729	$184,523.00
Total: $247,590.04							

Total This Period: $947,678.74

one award under the Alternative Fuel School Bus Incentives Program. These contracts are executed.

On February 7, 2014, the SCAQMD Governing Board approved two awards under the Local Government Match Program and one award under the Alternative Fuel Infrastructure Program. These contracts are with the SCAQMD Board Chair for signature or executed.

On April 4, 2014, the SCAQMD Governing Board approved two awards under the Local Government Match Program and three awards under the Traffic Signal Synchronization Partnership Program. These contracts are executed.

On May 2, 2014, the SCAQMD Governing Board approved 12 awards under the Local Government Match Program. These contracts are awaiting responses from the prospective contractor, with the prospective contractor for signature, with the SCAQMD Board Chair for signature, or executed.

On June 6, 2014, the SCAQMD Governing Board approved an award under the Traffic Signal Synchronization Partnership Program. This contract is executed.

On July 11, 2014, the SCAQMD Governing Board approved an award under the Traffic Signal Synchronization Partnership Program. This contract is executed.

On September 5, 2014, the SCAQMD Governing Board approved an award under the Event Center Transportation Program. This contract is with the SCAQMD Board Chair for signature.

On October 3, 2014, the SCAQMD Governing Board approved an award under the Alternative Fuel Infrastructure Program. This contract is with the SCAQMD Board Chair for signature.

On December 5, 2014, the SCAQMD Governing Board approved 12 awards under the Alternative Fuel Infrastructure Program and two awards under the Event Center Transportation Program. These contracts are under development or undergoing internal review.

Work Program Status

Contract Status Reports for work program years with open and pending contracts are attached. MSRC or MSRC-TAC members may request spreadsheets covering any other work program year.

FY 2004-05 Work Program Contracts

One contract from this work program year is open.

FY 2004-05 Invoices Paid

No invoices were paid during this period.

FY 2005-06 Work Program Contracts

5 contracts from this work program year are open; and 3 are in "Open/Complete" status, having completed all obligations save ongoing operation. 2 contracts closed during this period: City of South Pasadena, Contract #ML06064 – Purchase 2 Heavy-Duty CNG Vehicles; and Clean Energy Fuels Corp., Contract #MS06049 – Install New CNG Station at Long Beach Police Department.

FY 2005-06 Work Program Invoices Paid
No invoices were paid during this period.

FY 2006-07 Work Program Contracts
5 contracts from this work program year are open; and 21 are in "Open/Complete" status. One contract closed during this period: City of Los Angeles, Department of General Services, Contract #MS07061 – "Showcase" Off-Road Diesel Retrofit Program.

FY 2006-07 Invoices Paid
No invoices were paid during this period.

FY 2007-08 Work Program Contracts
11 contracts from this work program year are open; and 40 are in "Open/Complete" status.

FY 2007-08 Invoices Paid
No invoices were paid during this period.

FY 2008-09 Work Program Contracts
6 contracts from this work program year are open; and 15 are in "Open/Complete" status. One contract moved into "Open/Complete" status during this period: City of South Pasadena, Contract #ML09009 – CNG Station Expansion.

FY 2008-09 Invoices Paid
No invoices were paid during this period.

FY 2009-10 Work Program Contracts
3 contracts from this work program year are open; and 13 are in "Open/Complete" status. One contract was canceled during this period, due to a decision to lease rather than purchasing a vehicle: City of Sierra Madre, Contract #MS10003 – Purchase One Heavy-Duty CNG Vehicle. Two contracts passed into "Open/Complete" status during this period: Nationwide Environmental Services, Contract #MS10006 – Purchase Three CNG Street Sweepers; and Ryder System Inc., Contract #MS10017 – Purchase 19 Heavy-Duty Natural Gas Vehicles.

FY 2009-10 Invoices Paid
One invoice in the amount of $9,488.70 was paid during this period.

FY 2010-11 Work Program Contracts
34 contracts from this work program year are open; and 20 are in "Open/Complete" status. One proposed contract with the Los Angeles Unified School District is still with them for signature following MSRC approval of modifications. Lastly, one proposed contract with Ivanhoe Energy Services and Development is still with the prospective contractor for signature. In October, the MSRC-TAC recommended that Ivanhoe come back with a report in March 2015.

FY 2010-11 Invoices Paid
3 invoices totaling $630,600.00 were paid during this period.

FY 2011-12 Work Program Contracts
54 contracts from this work program year are open, and 15 are in "Open/Complete" status. One contract moved into "Open/Complete" status during this period: City of Redlands, Contract

#ML12039 – Purchase 3 Heavy-Duty Natural Gas Vehicles.

FY 2011-12 Invoices Paid
One invoice in the amount of $60,000.00 was paid during this period.

FYs 2012-14 Work Program Contracts
37 contracts from this work program year are open, and one is in "Open/Complete" status. One contract closed during this period: Southern California Regional Rail Authority (Metrolink), Contract #MS14047 – Special Metrolink Service to Auto Club Speedway.

FYs 2012-14 Invoices Paid
3 invoices totaling $247,590.04 were paid during this period.

Administrative Scope Changes
3 administrative scope changes were initiated during the period of October 30 to December 31, 2014:

- MS12080 – City of Pasadena (Expand CNG Station) – One-year no-cost term extension
- ML14056 – City of Redlands (Install Bicycle Lanes) – One-year no-cost term extension
- ML14064 – City of Claremont (Purchase 2 Heavy-Duty CNG Vehicles) – Six-month no-cost term extension

Attachments

- FY 2004-05 through FYs 2012-14 Contract Status Reports

MSRC Database
Mobile Source Air Pollution Reduction Review Committee

FYs 2004-05 Through 2012-14 AB2766 Contract Status Report

1/9/2015

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
FY 2004-2005 Contracts									
Open Contracts									
ML05014	Los Angeles County Department of	5/21/2007	11/20/2008	3/20/2016	$204,221.00	$0.00	Traffic Signal Synchronization	$204,221.00	No
Total: 1									
Declined/Cancelled Contracts									
ML05005	City of Highland				$20,000.00	$0.00	2 Medium Duty CNG Vehicles	$20,000.00	No
ML05008	Los Angeles County Department of				$140,000.00	$0.00	7 Heavy Duty LPG Street Sweepers	$140,000.00	No
ML05010	Los Angeles County Department of				$20,000.00	$0.00	1 Heavy Duty CNG Bus	$20,000.00	No
Total: 3									
Closed Contracts									
ML05006	City of Colton Public Works	7/27/2005	7/26/2006		$30,000.00	$30,000.00	3 Medium Duty CNG Vehicles	$0.00	Yes
ML05011	Los Angeles County Department of	8/10/2006	12/9/2007	6/9/2008	$52,409.00	$51,048.46	3 Heavy Duty LPG Shuttle Vans	$1,360.54	Yes
ML05013	Los Angeles County Department of	1/5/2007	7/4/2008	1/4/2013	$313,000.00	$313,000.00	Traffic Signal Synchronization	$0.00	Yes
ML05015	City of Lawndale	7/27/2005	7/26/2006		$10,000.00	$10,000.00	1 Medium Duty CNG Vehicle	$0.00	Yes
ML05016	City of Santa Monica	9/23/2005	9/22/2006	9/22/2007	$350,000.00	$350,000.00	6 MD CNG Vehicles, 1 LPG Sweep, 13 CNG	$0.00	Yes
ML05017	City of Signal Hill	1/16/2006	7/15/2007		$126,000.00	$126,000.00	Traffic Signal Synchronization	$0.00	Yes
ML05018	City of San Bernardino	4/19/2005	4/18/2006		$40,000.00	$40,000.00	4 M.D. CNG Vehicles	$0.00	Yes
ML05019	City of Lakewood	5/6/2005	5/5/2006		$10,000.00	$10,000.00	1 M.D. CNG Vehicle	$0.00	Yes
ML05020	City of Pomona	6/24/2005	6/23/2006		$10,000.00	$10,000.00	1 M.D. CNG Vehicle	$0.00	Yes
ML05021	City of Whittier	7/7/2005	7/6/2006	4/6/2008	$100,000.00	$80,000.00	Sweeper, Aerial Truck, & 3 Refuse Trucks	$20,000.00	Yes
ML05022	City of Claremont	9/23/2005	9/22/2006		$20,000.00	$20,000.00	2 M.D. CNG Vehicles	$0.00	Yes
ML05024	City of Cerritos	4/18/2005	3/17/2006		$10,000.00	$10,000.00	1 M.D. CNG Vehicle	$0.00	Yes
ML05025	City of Malibu	5/6/2005	3/5/2006		$10,000.00	$10,000.00	1 Medium-Duty CNG Vehicle	$0.00	Yes
ML05026	City of Inglewood	1/6/2006	1/5/2007	2/5/2009	$60,000.00	$60,000.00	2 CNG Transit Buses, 1 CNG Pothole Patch	$0.00	Yes
ML05027	City of Beaumont	2/23/2006	4/22/2007	6/22/2010	$20,000.00	$20,000.00	1 H.D. CNG Bus	$0.00	Yes
ML05028	City of Anaheim	9/8/2006	9/7/2007	5/7/2008	$85,331.00	$85,331.00	Traffic signal coordination & synchronization	$0.00	Yes
ML05029	Los Angeles World Airports	5/5/2006	9/4/2007		$140,000.00	$140,000.00	Seven CNG Buses	$0.00	Yes
ML05071	City of La Canada Flintridge	1/30/2009	1/29/2011		$20,000.00	$20,000.00	1 CNG Bus	$0.00	Yes
ML05072	Los Angeles County Department of	8/24/2009	5/23/2010	1/23/2011	$349,000.00	$349,000.00	Traffic Signal Synchronization (LADOT)	$0.00	Yes
Total: 19									
Closed/Incomplete Contracts									

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
ML05007	Los Angeles County Dept of Beache	6/23/2006	6/22/2007	12/22/2007	$50,000.00	$0.00	5 Medium Duty CNG Vehicles	$50,000.00	No
ML05009	Los Angeles County Department of	6/22/2006	12/21/2007	9/30/2011	$56,666.00	$0.00	2 Propane Refueling Stations	$56,666.00	No
ML05012	Los Angeles County Department of	11/10/2006	5/9/2008	1/9/2009	$349,000.00	$0.00	Traffic Signal Synchronization (LADOT)	$349,000.00	No
ML05023	City of La Canada Flintridge	3/30/2005	2/28/2006	8/28/2008	$20,000.00	$0.00	1 CNG Bus	$20,000.00	No

Total: 4

FY 2005-2006 Contracts

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
Open Contracts									
ML06031	City of Inglewood	4/4/2007	6/3/2013	9/3/2015	$150,000.00	$65,602.40	Purchase 4 H-D LPG Vehicles & Install LPG	$84,397.60	No
ML06035	City of Hemet, Public Works	11/10/2006	12/9/2012	1/9/2017	$338,107.00	$175,000.00	7 Nat Gas Trucks & New Nat Gas Infrastruct	$163,107.00	No
ML06054	Los Angeles County Department of	6/17/2009	6/16/2016		$150,000.00	$0.00	3 CNG & 3 LPG HD Trucks	$150,000.00	No
ML06070	City of Colton	4/30/2008	2/28/2015	4/30/2015	$50,000.00	$0.00	Two CNG Pickups	$50,000.00	No
ML06071	City of Santa Monica	6/13/2014		11/30/2016	$149,925.00	$0.00	3 H.D. CNG Trucks & CNG Fueling Station	$149,925.00	No
Total: 5									
Declined/Cancelled Contracts									
ML06018	Los Angeles County Dept of Beache				$375,000.00	$0.00	New CNG Station & 2 CNG Dump Trucks	$375,000.00	No
ML06019	Los Angeles County Dept of Beache				$250,000.00	$0.00	New CNG Station & 2 CNG Dump Trucks	$250,000.00	No
ML06023	City of Baldwin Park	6/16/2006	9/15/2012		$20,000.00	$0.00	CNG Dump Truck	$20,000.00	No
ML06024	City of Pomona	8/3/2007	7/2/2013	7/2/2014	$286,450.00	$0.00	New CNG Station	$286,450.00	No
ML06030	City of Burbank	3/19/2007	9/18/2011		$287,700.00	$0.00	New CNG Fueling Station	$287,700.00	No
ML06037	City of Lynwood				$25,000.00	$0.00	1 Nat Gas Dump Truck	$25,000.00	No
ML06039	City of Inglewood	2/9/2007	2/8/2008	4/8/2011	$50,000.00	$0.00	Modify Maintenance Facility for CNG Vehicle	$50,000.00	No
ML06055	City of Los Angeles, Dept. of Genera				$125,000.00	$0.00	5 Gas-Electric Hybrid Buses	$125,000.00	No
ML06059	City of Fountain Valley				$25,000.00	$0.00	One H.D. CNG Truck	$25,000.00	No
MS06009	Clean Energy Fuels Corp.	6/23/2006	12/22/2012		$250,000.00	$0.00	New CNG Station - Laguna Niguel	$250,000.00	Yes
MS06040	Capistrano Unified School District				$136,000.00	$0.00	New CNG Fueling Station	$136,000.00	No
MS06041	Clean Energy Fuels Corp.	12/1/2006	3/31/2013	6/18/2009	$250,000.00	$0.00	New CNG Station-Newport Beach	$250,000.00	No
MS06046	City of Long Beach, Dept. of Public				$250,000.00	$0.00	LNG Fueling Station	$250,000.00	No
MS06051	Menifee Union School District	3/2/2007	7/1/2014		$150,000.00	$0.00	CNG Fueling Station	$150,000.00	No
Total: 14									
Closed Contracts									
ML06016	City of Whittier	5/25/2006	5/24/2012	11/24/2012	$50,000.00	$50,000.00	2 CNG Refuse Trucks	$0.00	Yes
ML06017	City of Claremont	8/2/2006	4/1/2012		$50,000.00	$50,000.00	2 CNG Refuse Trucks	$0.00	Yes
ML06020	Los Angeles Department of Water a	3/19/2007	9/18/2013	4/18/2014	$25,000.00	$25,000.00	CNG Aerial Truck	$0.00	Yes
ML06021	Los Angeles World Airports	9/13/2006	5/12/2013		$150,000.00	$150,000.00	6 CNG Buses	$0.00	Yes
ML06022	City of Los Angeles, Bureau of Sanit	5/4/2007	1/3/2014		$1,250,000.00	$1,250,000.00	50 LNG Refuse Trucks	$0.00	Yes
ML06026	City of Cerritos	10/27/2006	9/26/2010		$60,500.00	$60,500.00	CNG Station Upgrade	$0.00	Yes
ML06027	City of Redondo Beach	9/5/2006	5/4/2012	10/4/2012	$50,000.00	$50,000.00	2 Heavy-Duty CNG Trucks	$0.00	Yes
ML06028	City of Pasadena	9/29/2006	11/28/2012	3/28/2014	$245,000.00	$245,000.00	New CNG Station & Maint. Fac. Upgrades	$0.00	Yes
ML06029	City of Culver City Transportation De	9/29/2006	8/28/2012	12/28/2012	$50,000.00	$50,000.00	2 CNG Heavy-Duty Trucks	$0.00	Yes
ML06032	City of Rancho Cucamonga	2/13/2007	3/12/2013	2/12/2014	$237,079.00	$237,079.00	New CNG Station & 2 CNG Dump Trucks	$0.00	Yes
ML06033	City of Cathedral City	11/17/2006	12/16/2012	12/16/2013	$125,000.00	$125,000.00	5 Heavy-Duty CNG Trucks	$0.00	Yes

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
ML06034	City of South Pasadena	9/25/2006	9/24/2012		$16,422.42	$16,422.42	2 Nat. Gas Transit Buses	$0.00	Yes
ML06036	City of Riverside	3/23/2007	3/22/2013		$200,000.00	$200,000.00	8 Heavy-Duty Nat Gas Vehicles	$0.00	Yes
ML06038	City of Los Angeles, Department of	5/21/2007	1/20/2014		$625,000.00	$625,000.00	25 CNG Street Sweepers	$0.00	Yes
ML06044	City of Pomona	12/15/2006	3/14/2013		$50,000.00	$50,000.00	2 CNG Street Sweepers	$0.00	Yes
ML06052	City of Hemet, Public Works	4/20/2007	2/19/2013		$25,000.00	$25,000.00	Purchase One CNG Dump Truck	$0.00	Yes
ML06053	City of Burbank	5/4/2007	7/3/2013		$125,000.00	$125,000.00	Five Nat. Gas Refuse Trucks	$0.00	Yes
ML06056	City of Los Angeles, Dept. of Genera	11/30/2007	11/29/2008		$350,000.00	$350,000.00	Maintenance Facility Mods.	$0.00	Yes
ML06057	City of Rancho Cucamonga	8/28/2007	6/27/2013	8/27/2014	$100,000.00	$100,000.00	4 H.D. Nat. Gas Vehicles	$0.00	Yes
ML06058	City of Santa Monica	7/12/2007	7/11/2013		$149,925.00	$0.00	3 H.D. CNG Trucks & CNG Fueling Station	$149,925.00	No
ML06060	City of Temple City	6/12/2007	6/11/2013		$31,885.00	$0.00	Upgrade existing CNG infrastructure	$31,885.00	No
ML06061	City of Chino Hills	4/30/2007	4/29/2013		$25,000.00	$25,000.00	One H.D. CNG Vehicle	$0.00	Yes
ML06062	City of Redlands	5/11/2007	5/10/2013		$100,000.00	$100,000.00	4 H.D. LNG Vehicles	$0.00	Yes
ML06063	City of Moreno Valley	3/23/2007	11/22/2012		$25,000.00	$25,000.00	One H.D. CNG Vehicle	$0.00	Yes
ML06064	City of South Pasadena	1/25/2008	11/24/2013	11/24/2014	$50,000.00	$50,000.00	2 H.D. CNG Vehicles	$0.00	Yes
ML06065	City of Walnut	6/29/2007	6/28/2013		$44,203.00	$44,203.00	Upgrade Existing CNG Infrastructure	$0.00	Yes
ML06066	City of Ontario	5/30/2007	1/29/2013		$125,000.00	$125,000.00	5 H.D. CNG Vehicles	$0.00	Yes
ML06067	City of El Monte	3/17/2008	5/16/2014	11/16/2014	$157,957.00	$157,957.00	Upgrade existing CNG infrastructure	$0.00	Yes
ML06068	City of Claremont	8/28/2007	6/27/2013		$60,000.00	$60,000.00	Expand existing CNG infrastructure	$0.00	Yes
ML06069	City of Palos Verdes Estates	11/19/2007	11/18/2013		$25,000.00	$25,000.00	One H.D. CNG Vehicle	$0.00	Yes
MS06001	Riverside County Transportation Co	8/3/2007	9/2/2011		$825,037.00	$825,037.00	New Freeway Service Patrol	$0.00	Yes
MS06002	Orange County Transportation Autho	11/7/2007	11/6/2013		$928,740.00	$925,091.00	New Freeway Service Patrol	$3,649.00	Yes
MS06003	San Bernardino Associated Govern	10/19/2006	6/18/2010		$804,240.00	$804,239.87	New Freeway Service Patrol	$0.13	Yes
MS06004	Los Angeles County MTA	8/10/2006	7/9/2010		$1,391,983.00	$1,391,791.98	New Freeway Service Patrol	$191.02	Yes
MS06010	US Airconditioning Distributors	12/28/2006	6/27/2012		$83,506.00	$83,506.00	New CNG Station - Industry	$0.00	Yes
MS06011	County Sanitation Districts of L.A. C	6/1/2006	7/31/2012		$150,000.00	$150,000.00	New CNG Station - Carson	$0.00	Yes
MS06012	Consolidated Disposal Service	7/14/2006	9/13/2012	9/13/2014	$297,981.00	$297,981.00	New LNG Station & Facility Upgrades	$0.00	Yes
MS06042	Clean Energy Fuels Corp.	1/5/2007	1/4/2013		$150,000.00	$150,000.00	New CNG Station-Baldwin Park	$0.00	Yes
MS06043X	Westport Fuel Systems, Inc.	2/3/2007	12/31/2010	9/30/2011	$2,000,000.00	$2,000,000.00	Advanced Natural Gas Engine Incentive Pro	$0.00	Yes
MS06045	Orange County Transportation Autho	8/17/2007	12/16/2013		$200,000.00	$200,000.00	CNG Fueling Station/Maint. Fac. Mods	$0.00	Yes
MS06047	Hemet Unified School District	9/19/2007	11/18/2013		$125,000.00	$125,000.00	CNG Refueling Station	$0.00	Yes
MS06048	Newport-Mesa Unified School Distric	6/25/2007	8/24/2013	8/24/2014	$50,000.00	$50,000.00	CNG Fueling Station	$0.00	Yes
MS06050	Rossmoor Pastries	1/24/2007	10/23/2012		$18,750.00	$14,910.50	CNG Fueling Station	$3,839.50	Yes
Total: 43									
Open/Complete Contracts									
ML06025	City of Santa Monica	1/5/2007	11/4/2012	12/14/2014	$300,000.00	$300,000.00	12 H.D. CNG Vehicles	$0.00	Yes
MS06013	City of Commerce	1/9/2008	7/8/2014	7/8/2015	$350,000.00	$350,000.00	New L/CNG Station - Commerce	$0.00	Yes
MS06049	Clean Energy Fuels Corp.	4/20/2007	7/19/2013	11/30/2015	$250,000.00	$228,491.18	CNG Fueling Station - L.B.P.D.	$21,508.82	Yes

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
FY 2006-2007 Contracts									
Open Contracts									
ML07044	City of Santa Monica	9/8/2008	3/7/2015	3/7/2017	$600,000.00	$50,000.00	24 H.D. Nat. Gas Vehicles	$550,000.00	No
ML07045	City of Inglewood	2/6/2009	4/5/2015		$75,000.00	$25,000.00	3 H.D. Nat. Gas Vehicles	$50,000.00	No
MS07022	CSULA Hydrogen Station and Resea	10/30/2009	12/29/2015	10/29/2019	$250,000.00	$0.00	New Hydrogen Fueling Station	$250,000.00	No
MS07070	Griffith Company	4/30/2008	2/28/2010	8/28/2012	$168,434.00	$125,504.00	Off-Road Diesel Equipment Retrofit Program	$42,930.00	No
MS07080	City of Los Angeles, Bureau of Sanit	10/31/2008	8/30/2010	8/28/2016	$63,192.00	$62,692.00	Off-Road Diesel Equipment Retrofit Program	$500.00	No
Total: 5									
Declined/Cancelled Contracts									
ML07031	City of Santa Monica				$180,000.00	$0.00	Upgrade N.G. Station to Add Hythane	$180,000.00	No
ML07032	City of Huntington Beach Public Wor				$25,000.00	$0.00	One H.D. CNG Vehicle	$25,000.00	No
ML07035	City of Los Angeles, General Service				$350,000.00	$0.00	New CNG Refueling Station/Southeast Yard	$350,000.00	No
ML07038	City of Palos Verdes Estates				$25,000.00	$0.00	One H.D. LPG Vehicle	$25,000.00	No
MS07010	Palos Verdes Peninsula Transit Auth				$80,000.00	$0.00	Repower 4 Transit Buses	$80,000.00	No
MS07014	Clean Energy Fuels Corp.				$350,000.00	$0.00	New L/CNG Station - SERRF	$350,000.00	No
MS07015	Baldwin Park Unified School District				$57,500.00	$0.00	New CNG Station	$57,500.00	No
MS07016	County of Riverside Fleet Services D				$36,359.00	$0.00	New CNG Station - Rubidoux	$36,359.00	No
MS07017	County of Riverside Fleet Services D				$33,829.00	$0.00	New CNG Station - Indio	$33,829.00	No
MS07018	City of Cathedral City				$350,000.00	$0.00	New CNG Station	$350,000.00	No
MS07021	City of Riverside				$350,000.00	$0.00	New CNG Station	$350,000.00	No
MS07050	Southern California Disposal Co.				$320,000.00	$0.00	Ten Nat. Gas Refuse Trucks	$320,000.00	No
MS07062	Caltrans Division of Equipment				$1,081,818.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$1,081,818.00	No
MS07065	ECCO Equipment Corp.				$174,525.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$174,525.00	No
MS07067	Recycled Materials Company of Calif				$99,900.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$99,900.00	No
MS07069	City of Burbank	5/9/2008	3/8/2010	9/8/2011	$8,895.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$8,895.00	No
MS07074	Albert W. Davies, Inc.	1/25/2008	11/24/2009		$39,200.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$39,200.00	No
MS07081	Clean Diesel Technologies, Inc.				$240,347.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$240,347.00	No
MS07082	DCL International, Inc.				$153,010.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$153,010.00	No
MS07083	Dinex Exhausts, Inc.				$52,381.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$52,381.00	No
MS07084	Donaldson Company, Inc.				$42,416.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$42,416.00	No
MS07085	Engine Control Systems Limited				$155,746.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$155,746.00	No
MS07086	Huss, LLC				$84,871.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$84,871.00	No
MS07087	Mann+Hummel GmbH				$189,361.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$189,361.00	No
MS07088	Nett Technologies, Inc.				$118,760.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$118,760.00	No
MS07089	Rypos, Inc.				$68,055.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$68,055.00	No
MS07090	Sud-Chemie				$27,345.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$27,345.00	No

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
Total: 27									
Closed Contracts									
ML07025	City of San Bernardino	8/12/2008	7/11/2010		$350,000.00	$350,000.00	Maintenance Facility Modifications	$0.00	Yes
ML07026	City of South Pasadena	6/13/2008	6/12/2014		$25,000.00	$25,000.00	One H.D. CNG Vehicle	$0.00	Yes
ML07027	Los Angeles World Airports	6/3/2008	7/2/2014		$25,000.00	$25,000.00	One H.D. LNG Vehicle	$0.00	Yes
ML07028	City of Los Angeles, General Service	3/13/2009	3/12/2014		$350,000.00	$350,000.00	New CNG Refueling Station/Hollywood Yard	$0.00	Yes
ML07029	City of Los Angeles, General Service	3/13/2009	3/12/2014		$350,000.00	$350,000.00	New CNG Refueling Station/Venice Yard	$0.00	Yes
ML07033	City of La Habra	5/21/2008	6/20/2014	11/30/2013	$25,000.00	$25,000.00	One H.D. Nat Gas Vehicle	$0.00	Yes
ML07034	City of Los Angeles, General Service	3/13/2009	3/12/2014		$350,000.00	$350,000.00	New CNG Refueling Station/Van Nuys Yard	$0.00	Yes
ML07040	City of Moreno Valley	6/3/2008	9/2/2014		$25,000.00	$25,000.00	One Heavy-Duty CNG Vehicle	$0.00	Yes
ML07041	City of La Quinta	6/6/2008	6/5/2014		$25,000.00	$25,000.00	One CNG Street Sweeper	$0.00	Yes
ML07042	City of La Quinta	8/15/2008	9/14/2010		$100,000.00	$100,000.00	Street Sweeping Operations	$0.00	Yes
ML07046	City of Culver City Transportation De	5/2/2008	5/1/2014		$25,000.00	$25,000.00	One H.D. Nat. Gas Vehicle	$0.00	Yes
ML07048	City of Cathedral City	9/19/2008	10/18/2010		$100,000.00	$84,972.45	Street Sweeping Operations	$15,027.55	Yes
MS07001	A-Z Bus Sales, Inc.	12/28/2006	12/31/2007	2/29/2008	$1,920,000.00	$1,380,000.00	CNG School Bus Buydown	$540,000.00	Yes
MS07002	BusWest	1/19/2007	12/31/2007	3/31/2008	$840,000.00	$840,000.00	CNG School Bus Buydown	$0.00	Yes
MS07003	Westport Fuel Systems, Inc.	11/2/2007	12/31/2011	6/30/2013	$1,500,000.00	$1,499,990.00	Advanced Nat. Gas Engine Incentive Progra	$10.00	Yes
MS07005	S-W Compressors	3/17/2008	3/16/2010		$60,000.00	$7,500.00	Mountain CNG School Bus Demo Program-	$52,500.00	Yes
MS07006	Coachella Valley Association of Gov	2/28/2008	10/27/2008		$400,000.00	$400,000.00	Coachella Valley PM10 Reduction Street Sw	$0.00	Yes
MS07011	L A Service Authority for Freeway E	3/12/2010	5/31/2011	9/30/2011	$700,000.00	$700,000.00	"511" Commuter Services Campaign	$0.00	Yes
MS07012	City of Los Angeles, General Service	6/13/2008	6/12/2009	6/12/2010	$50,000.00	$50,000.00	Maintenance Facility Modifications	$0.00	Yes
MS07013	Rainbow Disposal Company, Inc.	1/25/2008	3/24/2014	9/24/2014	$350,000.00	$350,000.00	New High-Volume CNG Station	$0.00	Yes
MS07019	City of Cathedral City	1/9/2009	6/8/2010		$32,500.00	$32,500.00	Maintenance Facility Modifications	$0.00	Yes
MS07055	City of Culver City Transportation De	7/8/2008	9/7/2014		$192,000.00	$192,000.00	Six Nat. Gas Refuse Trucks	$0.00	Yes
MS07058	The Better World Group	11/17/2007	11/16/2009	11/16/2011	$247,690.00	$201,946.21	MSRC Programmatic Outreach Services	$45,743.79	Yes
MS07059	County Sanitation Districts of L.A. C	9/5/2008	9/4/2010	7/14/2012	$231,500.00	$231,500.00	Off-Road Diesel Equipment Retrofit Program	$0.00	Yes
MS07060	Community Recycling & Resource R	3/7/2008	1/6/2010	7/6/2011	$177,460.00	$98,471.00	Off-Road Diesel Equipment Retrofit Program	$78,989.00	Yes
MS07061	City of Los Angeles, Department of	10/31/2008	8/30/2010	2/28/2013	$40,626.00	$40,626.00	Off-Road Diesel Equipment Retrofit Program	$0.00	Yes
MS07063	Shimmick Construction Company, In	4/26/2008	2/25/2010	8/25/2011	$80,800.00	$11,956.37	Off-Road Diesel Equipment Retrofit Program	$68,843.63	No
MS07064	Altfillisch Contractors, Inc.	9/19/2008	7/18/2010	1/18/2011	$160,000.00	$155,667.14	Off-Road Diesel Equipment Retrofit Program	$4,332.86	Yes
MS07068	Sukut Equipment Inc.	1/23/2009	11/22/2010	5/22/2012	$26,900.00	$26,900.00	Off-Road Diesel Equipment Retrofit Program	$0.00	Yes
MS07071	Tiger 4 Equipment Leasing	9/19/2008	7/18/2010	1/18/2013	$210,937.00	$108,808.97	Off-Road Diesel Equipment Retrofit Program	$102,128.03	Yes
MS07072	City of Culver City Transportation De	4/4/2008	2/3/2010	8/3/2011	$72,865.00	$72,865.00	Off-Road Diesel Equipment Retrofit Program	$0.00	Yes
MS07075	Dan Copp Crushing	9/17/2008	7/16/2010	1/16/2012	$73,600.00	$40,200.00	Off-Road Diesel Equipment Retrofit Program	$33,400.00	No
MS07076	Reed Thomas Company, Inc.	8/15/2008	6/14/2010	3/14/2012	$339,073.00	$100,540.00	Off-Road Diesel Equipment Retrofit Program	$238,533.00	No
MS07079	Riverside County Transportation Co	1/30/2009	7/29/2013	12/31/2011	$20,000.00	$15,165.45	BikeMetro Website Migration	$4,834.55	Yes
MS07091	BusWest	10/16/2009	3/15/2010		$33,660.00	$33,660.00	Provide Lease for 2 CNG School Buses	$0.00	Yes

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
MS07092	Riverside County Transportation Co	9/1/2010	10/31/2011		$350,000.00	$350,000.00	"511" Commuter Services Campaign	$0.00	Yes
Total: 36									
Closed/Incomplete Contracts									
MS07004	BusWest	7/2/2007	7/1/2009		$90,928.00	$68,196.00	Provide Lease for 2 CNG School Buses	$22,732.00	No
MS07066	Skanska USA Civil West California D	6/28/2008	4/27/2010	10/27/2010	$111,700.00	$36,128.19	Off-Road Diesel Equipment Retrofit Program	$75,571.81	No
MS07073	PEED Equipment Co.	10/31/2008	8/30/2010		$11,600.00	$0.00	Off-Road Diesel Equipment Retrofit Program	$11,600.00	No
Total: 3									
Open/Complete Contracts									
ML07023	City of Riverside	6/20/2008	10/19/2014	7/19/2016	$462,500.00	$461,476.42	CNG Station Expansion/Purch. 14 H.D. Vehi	$1,023.58	No
ML07024	City of Garden Grove	3/7/2008	9/6/2014	7/6/2016	$75,000.00	$75,000.00	Three H.D. CNG Vehicles	$0.00	Yes
ML07030	County of San Bernardino Public Wo	7/11/2008	9/10/2015		$200,000.00	$200,000.00	8 Natural Gas H.D. Vehicles	$0.00	Yes
ML07036	City of Alhambra	1/23/2009	2/22/2015		$50,000.00	$50,000.00	2 H.D. CNG Vehicles	$0.00	Yes
ML07037	City of Los Angeles, General Service	10/8/2008	10/7/2015		$255,222.00	$255,222.00	Upgrade LNG/LCNG Station/East Valley Yar	$0.00	Yes
ML07039	City of Baldwin Park	6/6/2008	6/5/2014	8/5/2015	$50,000.00	$50,000.00	Two N.G. H.D. Vehicles	$0.00	Yes
ML07043	City of Redondo Beach	9/28/2008	7/27/2014	10/27/2016	$125,000.00	$125,000.00	Five H.D. CNG Transit Vehicles	$0.00	Yes
ML07047	City of Cathedral City	6/16/2008	9/15/2014	3/15/2015	$225,000.00	$225,000.00	Two H.D. Nat. Gas Vehicles/New CNG Fueli	$0.00	Yes
MS07007	Los Angeles World Airports	5/2/2008	11/1/2014		$420,000.00	$420,000.00	Purchase CNG 21 Transit Buses	$0.00	Yes
MS07008	City of Los Angeles, Department of T	9/18/2009	5/17/2020	9/17/2017	$1,900,000.00	$1,900,000.00	Purchase 95 Transit Buses	$0.00	Yes
MS07009	Orange County Transportation Autho	5/14/2008	4/13/2016		$800,000.00	$800,000.00	Purchase 40 Transit Buses	$0.00	Yes
MS07020	Avery Petroleum	5/20/2009	7/19/2015		$250,000.00	$250,000.00	New CNG Station	$0.00	Yes
MS07049	Palm Springs Disposal Services	10/23/2008	11/22/2014	9/22/2016	$96,000.00	$96,000.00	Three Nat. Gas Refuse Trucks	$0.00	Yes
MS07051	City of San Bernardino	8/12/2008	12/11/2014		$480,000.00	$480,000.00	15 Nat. Gas Refuse Trucks	$0.00	Yes
MS07052	City of Redlands	7/30/2008	11/29/2014		$160,000.00	$160,000.00	Five Nat. Gas Refuse Trucks	$0.00	Yes
MS07053	City of Claremont	7/31/2008	12/30/2014		$96,000.00	$96,000.00	Three Nat. Gas Refuse Trucks	$0.00	Yes
MS07054	Republic Services, Inc.	3/7/2008	9/6/2014	9/6/2016	$1,280,000.00	$1,280,000.00	40 Nat. Gas Refuse Trucks	$0.00	Yes
MS07056	City of Whittier	9/5/2008	3/4/2015		$32,000.00	$32,000.00	One Nat. Gas Refuse Trucks	$0.00	Yes
MS07057	CR&R, Inc.	7/31/2008	8/30/2014	6/30/2015	$896,000.00	$896,000.00	28 Nat. Gas Refuse Trucks	$0.00	No
MS07077	USA Waste of California, Inc.	5/1/2009	12/31/2014		$160,000.00	$160,000.00	Five Nat. Gas Refuse Trucks (Santa Ana)	$0.00	Yes
MS07078	USA Waste of California, Inc.	5/1/2009	12/31/2014	12/31/2015	$256,000.00	$256,000.00	Eight Nat. Gas Refuse Trucks (Dewey's)	$0.00	Yes
Total: 21									

FY 2007-2008 Contracts

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
Open Contracts									
ML08028	City of Santa Monica	9/11/2009	9/10/2016	5/10/2019	$600,000.00	$0.00	24 CNG Heavy-Duty Vehicles	$600,000.00	No
ML08030	City of Azusa	5/14/2010	3/13/2016		$25,000.00	$0.00	1 CNG Heavy-Duty Vehicle	$25,000.00	No
ML08040	City of Riverside	9/11/2009	9/10/2016	3/10/2019	$455,500.00	$28,124.80	16 CNG Vehicles, Expand CNG Station & M	$427,375.20	No
ML08043	City of Desert Hot Springs	9/25/2009	3/24/2016		$25,000.00	$0.00	1 CNG Heavy-Duty Vehicle	$25,000.00	No
ML08080	City of Irvine	5/1/2009	5/31/2015		$50,000.00	$0.00	Two Heavy-Duty Nat. Gas Vehicles	$50,000.00	No
MS08007	United Parcel Service West Region	12/10/2008	10/9/2014	4/9/2019	$300,000.00	$0.00	10 H.D. Nat. Gas Vehicles	$300,000.00	No
MS08013	United Parcel Service West Region	12/10/2008	10/9/2014	3/9/2019	$480,000.00	$216,000.00	12 H.D. Nat. Gas Yard Tractors	$264,000.00	No
MS08015	Yosemite Waters	5/12/2009	5/11/2015		$180,000.00	$117,813.60	11 H.D. Propane Vehicles	$62,186.40	No
MS08018	Los Angeles County Department of	8/7/2009	10/6/2016	4/6/2018	$60,000.00	$0.00	3 CNG Vehicles	$60,000.00	No
MS08058	Clean Energy Fuels Corp.	11/26/2009	3/25/2016	3/25/2017	$400,000.00	$240,000.00	New CNG Station - Ontario Airport	$160,000.00	No
MS08068	Regents of the University of Californi	11/5/2010	11/4/2017	11/4/2019	$400,000.00	$0.00	Hydrogen Station	$400,000.00	No
Total: 11									
Declined/Cancelled Contracts									
ML08032	City of Irvine	5/1/2009	8/31/2010		$9,000.00	$0.00	36 Vehicles (Diagnostic)	$9,000.00	No
ML08041	City of Los Angeles, Dept of Transpo	8/6/2010	7/5/2011	12/5/2011	$8,800.00	$0.00	73 Vehicles (Diagnostic)	$8,800.00	No
ML08049	City of Cerritos	3/20/2009	1/19/2015	2/19/2017	$25,000.00	$0.00	1 CNG Heavy-Duty Vehicle	$25,000.00	No
ML08051	City of Colton				$75,000.00	$0.00	3 CNG Heavy-Duty Vehicles	$75,000.00	No
MS08002	Orange County Transportation Autho				$1,500,000.00	$0.00	Big Rig Freeway Service Patrol	$1,500,000.00	No
MS08008	Diversified Truck Rental & Leasing				$300,000.00	$0.00	10 H.D. Nat. Gas Vehicles	$300,000.00	No
MS08010	Orange County Transportation Autho				$10,000.00	$0.00	20 H.D. Nat. Gas Vehicles	$10,000.00	No
MS08011	Green Fleet Systems, LLC				$10,000.00	$0.00	30 H.D. Nat. Gas Vehicles	$10,000.00	No
MS08052	Burrtec Waste Industries, Inc.	12/24/2008	11/23/2014	11/23/2015	$100,000.00	$0.00	New CNG Station - Fontana	$100,000.00	No
MS08054	Clean Energy Fuels Corp.				$400,000.00	$0.00	New LNG Station - Fontana	$400,000.00	No
MS08055	Clean Energy Fuels Corp.	11/26/2009	3/25/2016	3/25/2017	$400,000.00	$0.00	New LNG Station - Long Beach-Pier S	$400,000.00	No
MS08059	Burrtec Waste Industries, Inc.	12/24/2008	11/23/2014		$100,000.00	$0.00	New CNG Station - San Bernardino	$100,000.00	No
MS08060	Burrtec Waste Industries, Inc.	12/24/2008	11/23/2014		$100,000.00	$0.00	New CNG Station - Azusa	$100,000.00	No
MS08062	Go Natural Gas	9/25/2009	1/24/2016	1/24/2017	$400,000.00	$0.00	New CNG Station - Rialto	$400,000.00	No
MS08074	Fontana Unified School District	11/14/2008	12/13/2014		$200,000.00	$0.00	Expansion of Existing CNG station	$200,000.00	No
MS08077	Hythane Company, LLC				$144,000.00	$0.00	Upgrade Station to Hythane	$144,000.00	No
Total: 16									
Closed Contracts									
ML08023	City of Villa Park	11/7/2008	10/6/2012		$6,500.00	$5,102.50	Upgrade of Existing Refueling Facility	$1,397.50	Yes
ML08027	Los Angeles County Department of	7/20/2009	1/19/2011	1/19/2012	$6,901.00	$5,124.00	34 Vehicles (Diagnostic)	$1,777.00	No
ML08033	County of San Bernardino Public Wo	4/3/2009	2/2/2010		$14,875.00	$14,875.00	70 Vehicles (Diagnostic)	$0.00	Yes

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
ML08035	City of La Verne	3/6/2009	11/5/2009		$11,925.00	$11,925.00	53 Vehicles (Diagnostic)	$0.00	Yes
ML08036	City of South Pasadena	5/12/2009	7/11/2013		$169,421.00	$169,421.00	New CNG Station	$0.00	Yes
ML08045	City of Santa Clarita	2/20/2009	6/19/2010		$3,213.00	$3,150.00	14 Vehicles (Diagnostic)	$63.00	Yes
MS08001	Los Angeles County MTA	12/10/2010	6/9/2014		$1,500,000.00	$1,499,999.66	Big Rig Freeway Service Patrol	$0.34	Yes
MS08003	A-Z Bus Sales, Inc.	5/2/2008	12/31/2008	2/28/2009	$1,480,000.00	$1,400,000.00	Alternative Fuel School Bus Incentive Progr	$80,000.00	Yes
MS08004	BusWest	5/2/2008	12/31/2008		$1,440,000.00	$1,440,000.00	Alternative Fuel School Bus Incentive Progr	$0.00	Yes
MS08016	TransVironmental Solutions, Inc.	1/23/2009	12/31/2010	9/30/2011	$227,198.00	$80,351.34	Rideshare 2 School Program	$146,846.66	Yes
MS08065	Pupil Transportation Cooperative	11/20/2008	7/19/2014		$10,500.00	$10,500.00	Existing CNG Station Modifications	$0.00	Yes
MS09002	A-Z Bus Sales, Inc.	11/7/2008	12/31/2009	12/31/2010	$2,520,000.00	$2,460,000.00	Alternative Fuel School Bus Incentive Progr	$60,000.00	No
MS09004	A-Z Bus Sales, Inc.	1/30/2009	3/31/2009		$156,000.00	$156,000.00	Alternative Fuel School Bus Incentive Progr	$0.00	Yes
MS09047	BusWest	7/9/2010	12/31/2010	4/30/2011	$480,000.00	$480,000.00	Alternative Fuel School Bus Incentive Progr	$0.00	Yes
Total: 14									
Closed/Incomplete Contracts									
ML08025	Los Angeles County Department of	10/30/2009	3/29/2011		$75,000.00	$0.00	150 Vehicles (Diagnostic)	$75,000.00	No
MS08079	ABC Unified School District	1/16/2009	12/15/2009	12/15/2010	$50,000.00	$0.00	Maintenance Facility Modifications	$50,000.00	No
Total: 2									
Open/Complete Contracts									
ML08024	City of Anaheim	7/9/2010	7/8/2017	1/8/2018	$425,000.00	$425,000.00	9 LPG Buses and 8 CNG Buses	$0.00	No
ML08026	Los Angeles County Department of	7/20/2009	7/19/2016		$250,000.00	$250,000.00	10 LPG Heavy-Duty Vehicles	$0.00	Yes
ML08029	City of Gardena	3/19/2009	1/18/2015		$25,000.00	$25,000.00	1 Propane Heavy-Duty Vehicle	$0.00	Yes
ML08031	City of Claremont	3/27/2009	3/26/2013	3/26/2015	$97,500.00	$97,500.00	Upgrade of Existing CNG Station, Purchase	$0.00	Yes
ML08034	County of San Bernardino Public Wo	3/27/2009	7/26/2015		$150,000.00	$150,000.00	8 CNG Heavy-Duty Vehicles	$0.00	Yes
ML08037	City of Glendale	5/20/2009	5/19/2015		$325,000.00	$325,000.00	13 CNG Heavy-Duty Vehicles	$0.00	Yes
ML08038	Los Angeles Department of Water a	7/16/2010	7/15/2017		$1,050,000.00	$1,050,000.00	42 CNG Heavy-Duty Vehicles	$0.00	Yes
ML08039	City of Rancho Palos Verdes	6/5/2009	8/4/2015		$50,000.00	$50,000.00	2 LPG Transit Buses	$0.00	Yes
ML08042	City of Ontario	5/1/2009	1/31/2016		$175,000.00	$175,000.00	7 CNG Heavy-Duty Vehicles	$0.00	Yes
ML08044	City of Chino	3/19/2009	3/18/2015		$25,000.00	$25,000.00	1 CNG Heavy-Duty Vehicle	$0.00	Yes
ML08046	City of Paramount	2/20/2009	2/19/2015		$25,000.00	$25,000.00	1 CNG Heavy-Duty Vehicle	$0.00	Yes
ML08047	City of Culver City Transportation De	5/12/2009	8/11/2015		$150,000.00	$150,000.00	6 CNG Heavy-Duty Vehicles	$0.00	Yes
ML08048	City of Santa Clarita	2/20/2009	6/19/2015		$25,000.00	$25,000.00	1 CNG Heavy-Duty Vehicle	$0.00	Yes
ML08050	City of Laguna Beach Public Works	8/12/2009	4/11/2016	10/11/2016	$75,000.00	$75,000.00	3 LPG Trolleys	$0.00	Yes
MS08005	Burrtec Waste Industries, Inc.	10/23/2008	11/22/2014	10/22/2015	$450,000.00	$450,000.00	15 H.D. Nat. Gas Vehicles - Azusa	$0.00	Yes
MS08006	Burrtec Waste Industries, Inc.	10/23/2008	11/22/2014	10/22/2015	$450,000.00	$450,000.00	15 H.D. Nat. Gas Vehicles - Saugus	$0.00	Yes
MS08009	Los Angeles World Airports	12/24/2008	12/23/2014		$870,000.00	$870,000.00	29 H.D. Nat. Gas Vehicles	$0.00	Yes
MS08012	California Cartage Company, LLC	12/21/2009	10/20/2015	4/20/2016	$480,000.00	$480,000.00	12 H.D. Nat. Gas Yard Tractors	$0.00	Yes
MS08014	City of San Bernardino	12/5/2008	6/4/2015		$390,000.00	$360,000.00	13 H.D. Nat. Gas Vehicles	$30,000.00	Yes
MS08017	Omnitrans	12/13/2008	12/12/2015	12/12/2016	$900,000.00	$900,000.00	30 CNG Buses	$0.00	Yes

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
MS08019	Enterprise Rent-A-Car Company of L	2/12/2010	7/11/2016		$300,000.00	$300,000.00	10 CNG Vehicles	$0.00	Yes
MS08020	Ware Disposal Company, Inc.	11/25/2008	2/24/2016		$900,000.00	$900,000.00	30 CNG Vehicles	$0.00	Yes
MS08021	CalMet Services, Inc.	1/9/2009	1/8/2016	7/8/2016	$900,000.00	$900,000.00	30 CNG Vehicles	$0.00	Yes
MS08022	SunLine Transit Agency	12/18/2008	3/17/2015		$311,625.00	$311,625.00	15 CNG Buses	$0.00	Yes
MS08053	City of Los Angeles, Bureau of Sanit	2/18/2009	12/17/2015		$400,000.00	$400,000.00	New LNG/CNG Station	$0.00	Yes
MS08056	Clean Energy Fuels Corp.	11/26/2009	2/25/2015		$400,000.00	$400,000.00	New LNG Station - POLB-Anah. & I	$0.00	Yes
MS08057	Orange County Transportation Autho	5/14/2009	7/13/2015		$400,000.00	$400,000.00	New CNG Station - Garden Grove	$0.00	Yes
MS08061	Clean Energy Fuels Corp.	12/4/2009	3/3/2015		$400,000.00	$400,000.00	New CNG Station - L.A.-La Cienega	$0.00	Yes
MS08063	Go Natural Gas	9/25/2009	1/24/2016	1/24/2017	$400,000.00	$400,000.00	New CNG Station - Moreno Valley	$0.00	Yes
MS08064	Hemet Unified School District	1/9/2009	3/8/2015		$75,000.00	$75,000.00	Expansion of Existing Infrastructure	$0.00	Yes
MS08066	Clean Energy Fuels Corp.	11/26/2009	2/25/2015		$400,000.00	$400,000.00	New CNG Station - Palm Spring Airport	$0.00	Yes
MS08067	Trillium CNG	3/19/2009	6/18/2015	6/18/2016	$311,600.00	$254,330.00	New CNG Station	$57,270.00	Yes
MS08069	Perris Union High School District	6/5/2009	8/4/2015	8/4/2016	$225,000.00	$225,000.00	New CNG Station	$0.00	Yes
MS08070	Clean Energy Fuels Corp.	11/26/2009	2/25/2015		$400,000.00	$400,000.00	New CNG Station - Paramount	$0.00	Yes
MS08071	ABC Unified School District	1/16/2009	1/15/2015		$63,000.00	$63,000.00	New CNG Station	$0.00	Yes
MS08072	Clean Energy Fuels Corp.	12/4/2009	3/3/2015		$400,000.00	$354,243.38	New CNG Station - Burbank	$45,756.62	Yes
MS08073	Clean Energy Fuels Corp.	11/26/2009	2/25/2015		$400,000.00	$400,000.00	New CNG Station - Norwalk	$0.00	Yes
MS08075	Disneyland Resort	12/10/2008	2/1/2015		$200,000.00	$200,000.00	Expansion of Existing CNG Infrastructure	$0.00	Yes
MS08076	Azusa Unified School District	10/17/2008	11/16/2014	1/31/2017	$172,500.00	$172,500.00	New CNG station and maint. Fac. Modificati	$0.00	Yes
MS08078	SunLine Transit Agency	12/10/2008	6/9/2015	2/9/2016	$189,000.00	$189,000.00	CNG Station Upgrade	$0.00	Yes

Total: 40

FY 2008-2009 Contracts

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
Open Contracts									
ML09010	City of Palm Springs	1/8/2010	2/7/2016		$25,000.00	$0.00	1 Nat. Gas Heavy-Duty Vehicle	$25,000.00	No
ML09026	Los Angeles County Department of	10/15/2010	10/14/2017	4/14/2019	$150,000.00	$0.00	3 Off-Road Vehicles Repowers	$150,000.00	No
ML09032	Los Angeles World Airports	4/8/2011	4/7/2018		$175,000.00	$0.00	7 Nat. Gas Heavy-Duty Vehicles	$175,000.00	No
ML09033	City of Beverly Hills	3/4/2011	5/3/2017	5/3/2018	$550,000.00	$100,000.00	10 Nat. Gas Heavy-Duty Vehicles & CNG St	$450,000.00	No
ML09036	City of Long Beach Fleet Services B	5/7/2010	5/6/2017	5/6/2020	$875,000.00	$525,000.00	Purchase 35 LNG Refuse Trucks	$350,000.00	No
ML09047	Los Angeles County Department of	8/13/2014	8/12/2015		$400,000.00	$0.00	Maintenance Facility Modifications	$400,000.00	No
Total: 6									
Declined/Cancelled Contracts									
ML09017	County of San Bernardino Public Wo	1/28/2010	7/27/2016		$200,000.00	$0.00	8 Nat. Gas Heavy-Duty Vehicles	$200,000.00	No
ML09018	Los Angeles Department of Water a	7/16/2010	9/15/2012		$850,000.00	$0.00	Retrofit 85 Off-Road Vehicles w/DECS	$850,000.00	No
ML09019	City of San Juan Capistrano Public	12/4/2009	11/3/2010		$10,125.00	$0.00	Remote Vehicle Diagnostics/45 Vehicles	$10,125.00	No
ML09022	Los Angeles County Department of				$8,250.00	$0.00	Remote Vehicle Diagnostics/15 Vehicles	$8,250.00	No
ML09025	Los Angeles County Department of	10/15/2010	12/14/2012	6/14/2013	$50,000.00	$0.00	Remote Vehicle Diagnostics/85 Vehicles	$50,000.00	No
ML09028	Riverside County Waste Manageme				$140,000.00	$0.00	Retrofit 7 Off-Road Vehicles w/DECS	$140,000.00	No
ML09039	City of Inglewood				$310,000.00	$0.00	Purchase 12 H.D. CNG Vehicles and Remot	$310,000.00	No
ML09040	City of Cathedral City				$83,125.00	$0.00	Purchase 3 H.D. CNG Vehicles and Remote	$83,125.00	No
ML09044	City of San Dimas				$425,000.00	$0.00	Install CNG Station and Purchase 1 CNG S	$425,000.00	No
ML09045	City of Orange				$125,000.00	$0.00	Purchase 5 CNG Sweepers	$125,000.00	No
MS09003	FuelMaker Corporation				$296,000.00	$0.00	Home Refueling Apparatus Incentives	$296,000.00	No
Total: 11									
Closed Contracts									
ML09007	City of Rancho Cucamonga	2/26/2010	4/25/2012		$117,500.00	$62,452.57	Maintenance Facility Modification	$55,047.43	Yes
ML09013	City of Riverside Public Works	9/10/2010	12/9/2011	7/31/2013	$144,470.00	$128,116.75	Traffic Signal Synchr./Moreno Valley	$16,353.25	Yes
ML09014	City of Riverside Public Works	9/10/2010	12/9/2011	7/31/2013	$113,030.00	$108,495.94	Traffic Signal Synchr./Corona	$4,534.06	Yes
ML09015	City of Riverside Public Works	9/10/2010	12/9/2011	7/31/2013	$80,060.00	$79,778.52	Traffic Signal Synchr./Co. of Riverside	$281.48	Yes
ML09016	County of San Bernardino Public Wo	1/28/2010	3/27/2014		$50,000.00	$50,000.00	Install New CNG Station	$0.00	Yes
ML09020	County of San Bernardino	8/16/2010	2/15/2012		$49,770.00	$49,770.00	Remote Vehicle Diagnostics/252 Vehicles	$0.00	Yes
ML09021	City of Palm Desert	7/9/2010	3/8/2012		$39,450.00	$38,248.87	Traffic Signal Synchr./Rancho Mirage	$1,201.13	Yes
ML09024	Los Angeles County Department of	10/15/2010	12/14/2012	6/14/2013	$400,000.00	$0.00	Maintenance Facility Modifications	$400,000.00	No
ML09027	Los Angeles County Department of	7/23/2010	3/22/2012	6/22/2012	$150,000.00	$150,000.00	Freeway Detector Map Interface	$0.00	Yes
ML09030	City of Los Angeles GSD/Fleet Servi	6/18/2010	6/17/2011		$22,310.00	$22,310.00	Remote Vehicle Diagnostics/107 Vehicles	$0.00	No
MS09001	Administrative Services Co-Op/Long	3/5/2009	6/30/2012	12/31/2013	$225,000.00	$150,000.00	15 CNG Taxicabs	$75,000.00	Yes
MS09005	Gas Equipment Systems, Inc.	6/19/2009	10/18/2010		$71,000.00	$71,000.00	Provide Temp. Fueling for Mountain Area C	$0.00	Yes
Total: 12									

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
Open/Complete Contracts									
ML09008	City of Culver City Transportation De	1/19/2010	7/18/2016	7/18/2017	$175,000.00	$175,000.00	8 Nat. Gas Heavy-Duty Vehicles	$0.00	No
ML09009	City of South Pasadena	11/5/2010	12/4/2016	3/4/2019	$137,500.00	$125,930.00	CNG Station Expansion	$11,570.00	No
ML09011	City of San Bernardino	2/19/2010	5/18/2016		$250,000.00	$250,000.00	10 Nat. Gas Heavy-Duty Vehicles	$0.00	Yes
ML09012	City of Gardena	3/12/2010	11/11/2015		$25,000.00	$25,000.00	1 Nat. Gas Heavy-Duty Vehicle	$0.00	Yes
ML09023	Los Angeles County Department of	12/10/2010	12/9/2017		$50,000.00	$50,000.00	2 Heavy-Duty Alternative Fuel Transit Vehic	$0.00	No
ML09029	City of Whittier	11/6/2009	4/5/2016		$25,000.00	$25,000.00	1 Nat. Gas Heavy-Duty Vehicle	$0.00	Yes
ML09031	City of Los Angeles, Department of	10/29/2010	10/28/2017		$825,000.00	$825,000.00	33 Nat. Gas Heavy-Duty Vehicles	$0.00	Yes
ML09034	City of La Palma	11/25/2009	6/24/2015		$25,000.00	$25,000.00	1 LPG Heavy-Duty Vehicle	$0.00	Yes
ML09035	City of Fullerton	6/17/2010	6/16/2017	12/16/2018	$450,000.00	$450,000.00	2 Heavy-Duty CNG Vehicles & Install CNG	$0.00	Yes
ML09037	City of Redondo Beach	6/18/2010	6/17/2016		$50,000.00	$50,000.00	Purchase Two CNG Sweepers	$0.00	Yes
ML09038	City of Chino	9/27/2010	5/26/2017		$250,000.00	$250,000.00	Upgrade Existing CNG Station	$0.00	Yes
ML09041	City of Los Angeles, Bureau of Sanit	10/1/2010	9/30/2017		$875,000.00	$875,000.00	Purchase 35 H.D. Nat. Gas Vehicles	$0.00	Yes
ML09042	Los Angeles Department of Water a	12/10/2010	12/9/2017		$1,400,000.00	$1,400,000.00	Purchase 56 Dump Trucks	$0.00	Yes
ML09043	City of Covina	10/8/2010	4/7/2017	10/7/2018	$179,591.00	$179,591.00	Upgrade Existing CNG Station	$0.00	Yes
ML09046	City of Newport Beach	5/20/2010	5/19/2016		$162,500.00	$162,500.00	Upgrade Existing CNG Station, Maintenance	$0.00	Yes

Total: 15

FY 2009-2010 Contracts

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
Open Contracts									
MS10004	Linde LLC	3/2/2012	6/1/2018		$56,932.00	$51,237.90	Purchase 6 H.D. CNG Vehicles	$5,694.10	No
MS10005	Domestic Linen Supply Company, In	10/8/2010	7/7/2016		$47,444.00	$0.00	Purchase 5 Gas-Electric Hybrid Vehicles	$47,444.00	No
MS10015	County of Los Angeles Department o	3/14/2014	5/13/2016		$37,955.00	$0.00	Purchase 2 H.D. CNG Vehicles	$37,955.00	No
Total: 3									
Declined/Cancelled Contracts									
MS10003	City of Sierra Madre	5/11/2012	3/10/2018		$13,555.00	$0.00	Purchase 1 H.D. CNG Vehicle	$13,555.00	No
MS10013	City of San Bernardino				$68,834.00	$0.00	Purchase 9 H.D. LNG Vehicles	$68,834.00	No
MS10014	Serv-Wel Disposal				$18,977.00	$0.00	Purchase 2 H.D. CNG Vehicles	$18,977.00	No
MS10018	Shaw Transport Inc.				$81,332.00	$0.00	Purchase 6 H.D. LNG Vehicles	$81,332.00	No
MS10022	Los Angeles World Airports				$123,353.00	$0.00	Purchase 13 H.D. CNG Vehicles	$123,353.00	No
MS10023	Dix Leasing				$105,000.00	$0.00	Purchase 3 H.D. LNG Vehicles	$105,000.00	No
Total: 6									
Closed Contracts									
MS10001	Los Angeles County MTA	3/19/2010	2/28/2011	4/28/2011	$300,000.00	$196,790.61	Clean Fuel Transit Bus Service to Dodger St	$103,209.39	Yes
MS10002	Coachella Valley Association of Gov	6/18/2010	2/17/2011		$400,000.00	$400,000.00	Coachella Valley PM10 Reduction Street Sw	$0.00	Yes
MS10025	Elham Shirazi	2/18/2011	10/17/2012	2/17/2014	$199,449.00	$188,413.05	Telework Demonstration Program	$11,035.95	No
Total: 3									
Open/Complete Contracts									
MS10006	Nationwide Environmental Services	11/19/2010	4/18/2017	9/18/2019	$94,887.00	$94,887.00	Purchase Three Street Sweepers	$0.00	Yes
MS10007	Enterprise Rent-A-Car Company of L	7/15/2011	10/14/2017		$18,976.00	$18,976.00	Purchase 2 H.D. CNG Vehicles	$0.00	No
MS10008	Republic Services, Inc.	12/10/2010	5/9/2017		$123,354.00	$123,354.00	Purchase 4 CNG Refuse Collection Vehicles	$0.00	Yes
MS10009	Ware Disposal Company, Inc.	10/29/2010	3/28/2017		$123,353.00	$123,352.00	Purchase 4 CNG Refuse Trucks	$1.00	No
MS10010	New Bern Transport Corporation	10/29/2010	3/28/2017		$113,864.00	$113,864.00	Repower 4 Heavy-Duty Vehicles	$0.00	Yes
MS10011	Foothill Transit Agency	3/9/2012	2/8/2018		$113,865.00	$113,865.00	Purchase 12 H.D. CNG Vehicles	$0.00	Yes
MS10012	Foothill Transit Agency	3/9/2012	3/8/2019		$85,392.00	$85,392.00	Purchase 9 H.D. Electric Vehicles	$0.00	Yes
MS10016	Rio Hondo Community College	11/5/2010	5/4/2017		$16,077.00	$16,077.00	Purchase 1 CNG Shuttle Bus	$0.00	Yes
MS10017	Ryder System Inc.	12/30/2011	6/29/2018	12/29/2018	$651,377.00	$651,377.00	Purchase 19 H.D. Natural Gas Vehicles	$0.00	Yes
MS10019	EDCO Disposal Corporation	11/19/2010	2/18/2017		$379,549.00	$379,283.81	Purchase 11 H.D. CNG Refuse Trucks	$265.19	Yes
MS10020	American Reclamation, Inc.	5/6/2011	2/5/2018		$18,977.00	$18,977.00	Purchase 1 H.D. CNG Vehicle	$0.00	Yes
MS10021	City of Glendora	10/29/2010	11/28/2016		$9,489.00	$9,489.00	Purchase 1 H.D. CNG Vehicle	$0.00	Yes
MS10024	Frito-Lay North America	7/29/2011	9/28/2017		$47,444.00	$47,444.00	Purchase 5 Electric Vehicles	$0.00	Yes
Total: 13									

FY 2010-2011 Contracts

Open Contracts

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
ML11020	City of Indio	2/1/2013	3/31/2019		$30,000.00	$0.00	Retrofit one H.D. Vehicles w/DECS, repower	$30,000.00	No
ML11023	City of Rancho Cucamonga	4/20/2012	12/19/2018	9/19/2020	$260,000.00	$60,000.00	Expand Existing CNG Station, 2 H.D. Vehicl	$200,000.00	No
ML11024	County of Los Angeles, Dept of Publi	12/5/2014	6/4/2022		$90,000.00	$0.00	Purchase 3 Nat. Gas H.D. Vehicles	$90,000.00	No
ML11025	County of Los Angeles Department o	3/14/2014	9/13/2021		$150,000.00	$0.00	Purchase 5 Nat. Gas H.D. Vehicles	$150,000.00	No
ML11027	City of Los Angeles, Dept. of Genera	5/4/2012	7/3/2015		$300,000.00	$0.00	Maintenance Facility Modifications	$300,000.00	No
ML11029	City of Santa Ana	9/7/2012	3/6/2020		$262,500.00	$0.00	Expansion of Existing CNG Station, Install N	$262,500.00	No
ML11032	City of Gardena	3/2/2012	9/1/2018		$102,500.00	$0.00	Modify Maint. Facility, Expand CNG station,	$102,500.00	No
ML11036	City of Riverside	1/27/2012	1/26/2019		$670,000.00	$0.00	Install New CNG Station, Purchase 9 H.D. N	$670,000.00	No
ML11038	City of Santa Monica	5/18/2012	7/17/2018		$400,000.00	$0.00	Maintenance Facility Modifications	$400,000.00	No
ML11040	City of South Pasadena	5/4/2012	1/3/2019		$30,000.00	$0.00	Purchase 1 Nat. Gas H.D. Vehicle	$30,000.00	No
ML11041	City of Santa Ana	9/7/2012	11/6/2018		$265,000.00	$34,651.86	Purchase 7 LPG H.D. Vehicles, Retrofit 6 H.	$230,348.14	No
ML11045	City of Newport Beach	2/3/2012	8/2/2018	8/2/2020	$30,000.00	$0.00	Purchase 1 Nat. Gas H.D. Vehicle	$30,000.00	No
MS11001	Mineral LLC	4/22/2011	4/30/2013	4/30/2015	$111,827.00	$98,186.83	Design, Develop, Host and Maintain MSRC	$13,640.17	No
MS11010	Border Valley Trading	8/26/2011	10/25/2017	4/25/2020	$150,000.00	$0.00	New LNG Station	$150,000.00	No
MS11016	CR&R Incorporated	4/12/2013	10/11/2019		$100,000.00	$90,000.00	New CNG Station - Perris	$10,000.00	No
MS11019	City of Corona	11/29/2012	4/28/2020		$225,000.00	$0.00	Expansion of Existing CNG Station	$225,000.00	No
MS11055	KEC Engineering	2/3/2012	8/2/2018		$250,000.00	$180,000.00	Repower 5 H.D. Off-Road Vehicles	$70,000.00	No
MS11056	The Better World Group	12/30/2011	12/29/2013	12/29/2015	$196,836.00	$137,172.69	Programmatic Outreach Services	$59,663.31	No
MS11060	Rowland Unified School District	8/17/2012	1/16/2019	1/16/2020	$175,000.00	$0.00	New Limited Access CNG Station	$175,000.00	No
MS11061	Eastern Municipal Water District	3/29/2012	5/28/2015		$11,659.00	$1,450.00	Retrofit One Off-Road Vehicle under Showc	$10,209.00	No
MS11062	Load Center	9/7/2012	1/6/2016	12/6/2016	$175,384.00	$169,883.00	Retrofit Six Off-Road Vehicles under Showc	$5,501.00	No
MS11065	Temecula Valley Unified School Distr	8/11/2012	1/10/2019		$50,000.00	$0.00	Expansion of Existing CNG Station	$50,000.00	No
MS11067	City of Redlands	5/24/2012	11/23/2018	11/23/2019	$85,000.00	$0.00	Expansion of Existing CNG Station	$85,000.00	No
MS11068	Ryder System Inc.	7/28/2012	10/27/2018		$175,000.00	$157,500.00	New Public Access L/CNG Station (Fontana	$17,500.00	No
MS11069	Ryder System Inc.	7/28/2012	8/27/2018		$175,000.00	$157,500.00	New Public Access L/CNG Station (Orange)	$17,500.00	No
MS11071	City of Torrance Transit Department	12/22/2012	1/21/2019	1/21/2020	$175,000.00	$0.00	New Limited Access CNG Station	$175,000.00	No
MS11076	SA Recycling, LLC	5/24/2012	9/23/2015		$424,801.00	$0.00	Retrofit of 13 Off-Road Diesel Vehicles with	$424,801.00	No
MS11081	Metropolitan Stevedore Company	9/7/2012	1/6/2016		$45,416.00	$0.00	Install DECS on Two Off-Road Vehicles	$45,416.00	No
MS11082	Baumot North America, LLC	8/2/2012	12/1/2015		$65,958.00	$0.00	Install DECS on Four Off-Road Vehicles	$65,958.00	No
MS11085	City of Long Beach Fleet Services B	8/23/2013	12/22/2016		$159,012.00	$0.00	Retrofit Seven H.D. Off-Road Vehicles Unde	$159,012.00	No
MS11086	DCL America Inc.	6/7/2013	10/6/2016		$500,000.00	$0.00	Retrofit Eight H.D. Off-Road Vehicles Under	$500,000.00	No
MS11091	California Cartage Company, LLC	4/5/2013	8/4/2016		$55,000.00	$0.00	Retrofit Two H.D. Off-Road Vehicles Under	$55,000.00	No
MS11092	Griffith Company	2/15/2013	6/14/2016	12/14/2017	$390,521.00	$0.00	Retrofit 17 H.D. Off-Road Vehicles Under Sh	$390,521.00	No

Total: 33

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
Pending Execution Contracts									
MS11073	Los Angeles Unified School District				$175,000.00	$0.00	Expansion of Existing CNG Station	$175,000.00	No
MS11084	Ivanhoe Energy Services and Develo				$66,750.00	$0.00	Retrofit One H.D. Off-Road Vehicle Under S	$66,750.00	No
Total: 2									
Declined/Cancelled Contracts									
MS11013	Go Natural Gas, Inc.				$150,000.00	$0.00	New CNG Station - Huntington Beach	$150,000.00	No
MS11014	Go Natural Gas, Inc.				$150,000.00	$0.00	New CNG Station - Santa Ana	$150,000.00	No
MS11015	Go Natural Gas, Inc.				$150,000.00	$0.00	New CNG Station - Inglewood	$150,000.00	No
MS11046	Luis Castro				$40,000.00	$0.00	Repower One Heavy-Duty Vehicle	$40,000.00	No
MS11047	Ivan Borjas				$40,000.00	$0.00	Repower One Heavy-Duty Vehicle	$40,000.00	No
MS11048	Phase II Transportation				$1,080,000.00	$0.00	Repower 27 Heavy-Duty Vehicles	$1,080,000.00	No
MS11049	Ruben Caceras				$40,000.00	$0.00	Repower One Heavy-Duty Vehicle	$40,000.00	No
MS11050	Carlos Arrue				$40,000.00	$0.00	Repower One Heavy-Duty Vehicle	$40,000.00	No
MS11051	Francisco Vargas				$40,000.00	$0.00	Repower One Heavy-Duty Vehicle	$40,000.00	No
MS11053	Jose Ivan Soltero				$40,000.00	$0.00	Repower One Heavy-Duty Vehicle	$40,000.00	No
MS11054	Albino Meza				$40,000.00	$0.00	Repower One Heavy-Duty Vehicle	$40,000.00	No
MS11059	Go Natural Gas				$150,000.00	$0.00	New Public Access CNG Station - Paramou	$150,000.00	No
MS11063	Standard Concrete Products				$310,825.00	$0.00	Retrofit Two Off-Road Vehicles under Show	$310,825.00	No
MS11070	American Honda Motor Company				$100,000.00	$0.00	Expansion of Existing CNG Station	$100,000.00	No
MS11072	Trillium USA Company DBA Californi				$150,000.00	$0.00	New Public Access CNG Station	$150,000.00	No
MS11077	DCL America Inc.				$263,107.00	$0.00	Retrofit of 13 Off-Road Diesel Vehicles with	$263,107.00	No
MS11083	Cattrac Construction, Inc.				$500,000.00	$0.00	Install DECS on Eight Off-Road Vehicles	$500,000.00	No
MS11088	Diesel Emission Technologies				$32,750.00	$0.00	Retrofit Three H.D. Off-Road Vehicles Under	$32,750.00	No
MS11089	Diesel Emission Technologies				$9,750.00	$0.00	Retrofit One H.D. Off-Road Vehicle Under S	$9,750.00	No
MS11090	Diesel Emission Technologies				$14,750.00	$0.00	Retrofit One H.D. Off-Road Vehicle Under S	$14,750.00	No
Total: 20									
Closed Contracts									
ML11007	Coachella Valley Association of Gov	7/29/2011	7/28/2012		$250,000.00	$249,999.96	Regional PM10 Street Sweeping Program	$0.04	Yes
ML11035	City of La Quinta	11/18/2011	11/17/2012		$25,368.00	$25,368.00	Retrofit 3 On-Road Vehicles w/DECS	$0.00	Yes
MS11002	A-Z Bus Sales, Inc.	7/15/2011	12/31/2011	6/30/2013	$1,705,000.00	$1,705,000.00	Alternative Fuel School Bus Incentive Progr	$0.00	Yes
MS11003	BusWest	7/26/2011	12/31/2011	12/31/2012	$1,305,000.00	$1,305,000.00	Alternative Fuel School Bus Incentive Progr	$0.00	Yes
MS11004	Los Angeles County MTA	9/9/2011	2/29/2012		$450,000.00	$299,743.34	Clean Fuel Transit Service to Dodger Stadiu	$150,256.66	Yes
MS11006	Orange County Transportation Autho	10/7/2011	2/29/2012	8/31/2012	$268,207.00	$160,713.00	Metrolink Service to Angel Stadium	$107,494.00	Yes
MS11018	Orange County Transportation Autho	10/14/2011	1/31/2012		$211,360.00	$211,360.00	Express Bus Service to Orange County Fair	$0.00	Yes
MS11052	Krisda Inc	9/27/2012	6/26/2013		$120,000.00	$120,000.00	Repower Three Heavy-Duty Vehicles	$0.00	Yes
MS11057	Riverside County Transportation Co	7/28/2012	3/27/2013		$100,000.00	$89,159.40	Develop and Implement 511 "Smart Phone"	$10,840.60	Yes
MS11058	L A Service Authority for Freeway E	5/31/2013	4/30/2014		$123,395.00	$123,395.00	Implement 511 "Smart Phone" Application	$0.00	No

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
MS11074	SunLine Transit Agency	5/11/2012	7/31/2012		$41,849.00	$22,391.00	Transit Service for Coachella Valley Festival	$19,458.00	Yes
MS11080	Southern California Regional Rail Au	4/6/2012	7/31/2012		$26,000.00	$26,000.00	Metrolink Service to Auto Club Speedway	$0.00	Yes
Total: 12									
Closed/Incomplete Contracts									
MS11064	City of Hawthorne	7/28/2012	8/27/2018	8/27/2019	$175,000.00	$0.00	New Limited Access CNG Station	$175,000.00	No
Total: 1									
Open/Complete Contracts									
ML11021	City of Whittier	1/27/2012	9/26/2018	6/26/2019	$210,000.00	$210,000.00	Purchase 7 Nat. Gas H.D. Vehicles	$0.00	No
ML11022	City of Anaheim	3/16/2012	7/15/2018		$150,000.00	$150,000.00	Purchase of 5 H.D. Vehicles	$0.00	No
ML11026	City of Redlands	3/2/2012	10/1/2018		$90,000.00	$90,000.00	Purchase 3 Nat. Gas H.D. Vehicles	$0.00	Yes
ML11028	City of Glendale	1/13/2012	5/12/2018		$300,000.00	$300,000.00	Purchase 10 H.D. CNG Vehicles	$0.00	Yes
ML11030	City of Fullerton	2/3/2012	3/2/2018		$109,200.00	$109,200.00	Purchase 2 Nat. Gas H.D. Vehicles, Retrofit	$0.00	Yes
ML11031	City of Culver City Transportation De	12/2/2011	12/1/2018		$300,000.00	$300,000.00	Purchase 10 H.D. Nat. Gas Vehicles	$0.00	Yes
ML11033	City of Los Angeles, Bureau of Sanit	3/16/2012	1/15/2019		$1,080,000.00	$1,080,000.00	Purchase 36 LNG H.D. Vehicles	$0.00	Yes
ML11034	City of Los Angeles, Department of	5/4/2012	1/3/2019		$630,000.00	$630,000.00	Purchase 21 H.D. CNG Vehicles	$0.00	No
ML11037	City of Anaheim	12/22/2012	12/21/2019		$300,000.00	$300,000.00	Purchase 12 Nat. Gas H.D. Vehicles	$0.00	Yes
ML11039	City of Ontario	1/27/2012	9/26/2018		$180,000.00	$180,000.00	Purchase 6 Nat. Gas H.D. Vehicles	$0.00	Yes
ML11042	City of Chino	2/17/2012	4/16/2018		$30,000.00	$30,000.00	Purchase 1 Nat. Gas H.D. Vehicle, Repower	$0.00	No
ML11043	City of Hemet Public Works	2/3/2012	2/2/2019		$60,000.00	$60,000.00	Purchase 2 H.D. Nat. Gas Vehicles	$0.00	No
ML11044	City of Ontario	1/27/2012	6/26/2019		$400,000.00	$400,000.00	Expand Existing CNG Station	$0.00	Yes
MS11008	USA Waste of California, Inc.	10/24/2013	4/23/2020		$125,000.00	$125,000.00	Expansion of Existing LCNG Station	$0.00	Yes
MS11009	USA Waste of California, Inc.	10/24/2013	4/23/2020		$125,000.00	$125,000.00	Expansion of Existing LCNG Station	$0.00	Yes
MS11011	EDCO Disposal Corporation	12/30/2011	4/29/2019		$100,000.00	$100,000.00	New CNG Station - Signal Hill	$0.00	Yes
MS11012	EDCO Disposal Corporation	12/30/2011	4/29/2019		$100,000.00	$100,000.00	New CNG Station - Buena Park	$0.00	Yes
MS11017	CR&R, Inc.	3/2/2012	2/1/2018		$100,000.00	$100,000.00	Expansion of existing station - Garden Grov	$0.00	Yes
MS11066	Torrance Unified School District	11/19/2012	9/18/2018		$42,296.00	$42,296.00	Expansion of Existing CNG Station	$0.00	Yes
MS11079	Bear Valley Unified School District	2/5/2013	10/4/2019		$175,000.00	$175,000.00	New Limited Access CNG Station	$0.00	Yes
MS11087	Cemex Construction Material Pacific,	10/16/2012	2/15/2016		$448,766.00	$448,760.80	Retrofit 13 H.D. Off-Road Vehicles Under Sh	$5.20	Yes
Total: 21									

FY 2011-2012 Contracts

Open Contracts

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
ML12013	City of Pasadena	10/19/2012	3/18/2015		$200,000.00	$0.00	Electric Vehicle Charging Infrastructure	$200,000.00	No
ML12014	City of Santa Ana	11/8/2013	8/7/2020		$384,000.00	$4,709.00	9 H.D. Nat. Gas & LPG Trucks, EV Charging	$379,291.00	No
ML12015	City of Fullerton	4/25/2013	11/24/2020		$40,000.00	$10,000.00	HD CNG Vehicle, Expand CNG Station	$30,000.00	No
ML12016	City of Cathedral City	1/4/2013	10/3/2019		$60,000.00	$0.00	CNG Vehicle & Electric Vehicle Infrastructur	$60,000.00	No
ML12017	City of Los Angeles, Bureau of Sanit	6/26/2013	5/25/2020		$950,000.00	$0.00	32 H.D. Nat. Gas Vehicles	$950,000.00	No
ML12018	City of West Covina	10/18/2013	10/17/2020		$300,000.00	$0.00	Expansion of Existing CNG Station	$300,000.00	No
ML12019	City of Palm Springs	9/6/2013	7/5/2015		$38,000.00	$0.00	EV Charging Infrastructure	$38,000.00	No
ML12020	City of Los Angeles, Department of	9/27/2012	3/26/2019		$450,000.00	$0.00	15 H.D. Nat. Gas Vehicles	$450,000.00	No
ML12021	City of Rancho Cucamonga	9/14/2012	1/13/2020		$40,000.00	$30,000.00	Four Medium-Duty Nat. Gas Vehicles	$10,000.00	No
ML12022	City of La Puente	12/6/2013	6/5/2020		$110,000.00	$70,000.00	2 Medium-Duty and Three Heavy-Duty CNG	$40,000.00	No
ML12023	County of Los Angeles Internal Servi	8/1/2013	2/28/2015		$250,000.00	$0.00	EV Charging Infrastructure	$250,000.00	No
ML12041	City of Anaheim Public Utilities Depa	4/4/2014	10/3/2015		$68,977.00	$0.00	EV Charging Infrastructure	$68,977.00	No
ML12043	City of Hemet	6/24/2013	9/23/2019		$60,000.00	$0.00	Two Heavy-Duty Nat. Gas Vehicles	$60,000.00	No
ML12045	City of Baldwin Park DPW	2/14/2014	12/13/2020		$400,000.00	$0.00	Install New CNG Station	$400,000.00	No
ML12046	City of Irvine	8/11/2013	3/10/2021		$30,000.00	$0.00	One Heavy-Duty Nat. Gas Vehicle	$30,000.00	No
ML12048	City of La Palma	1/4/2013	11/3/2018		$20,000.00	$0.00	Two Medium-Duty LPG Vehicles	$20,000.00	No
ML12049	City of Rialto Public Works	7/14/2014	9/13/2015		$30,432.00	$0.00	EV Charging Infrastructure	$30,432.00	No
ML12050	City of Baldwin Park	4/25/2013	4/24/2014	10/24/2014	$402,400.00	$385,363.00	EV Charging Infrastructure	$17,037.00	No
ML12051	City of Bellflower	2/7/2014	2/6/2016		$270,000.00	$0.00	EV Charging Infrastructure	$270,000.00	No
ML12052	City of Whittier	3/14/2013	7/13/2019		$165,000.00	$0.00	Expansion of Existing CNG Station	$165,000.00	No
ML12054	City of Palm Desert	9/30/2013	2/28/2015		$77,385.00	$0.00	EV Charging Infrastructure	$77,385.00	No
ML12057	City of Coachella	8/28/2013	8/27/2019		$57,456.00	$0.00	Purchase One Nat. Gas H.D. Vehicle/Street	$57,456.00	No
ML12066	City of Manhattan Beach	1/7/2014	4/6/2015		$5,900.00	$0.00	Electric Vehicle Charging Infrastructure	$5,900.00	No
MS12001	Los Angeles County MTA	7/1/2012	4/30/2013		$300,000.00	$0.00	Clean Fuel Transit Service to Dodger Stadiu	$300,000.00	No
MS12004	USA Waste of California, Inc.	10/24/2013	11/23/2019		$175,000.00	$0.00	Construct New Limited-Access CNG Station	$175,000.00	No
MS12008	Bonita Unified School District	7/12/2013	12/11/2019		$175,000.00	$0.00	Construct New Limited-Acess CNG Station	$175,000.00	No
MS12009	Sysco Food Services of Los Angeles	1/7/2014	4/6/2020		$150,000.00	$0.00	Construct New Public-Access CNG Station	$150,000.00	No
MS12011	Southern California Gas Company	6/14/2013	6/13/2019	6/13/2020	$150,000.00	$0.00	Construct New Public-Access CNG Station -	$150,000.00	No
MS12024	Southern California Gas Company	6/13/2013	12/12/2019		$150,000.00	$0.00	Construct New Public-Access CNG Station -	$150,000.00	No
MS12027	C.V. Ice Company, Inc.	5/17/2013	11/16/2019		$75,000.00	$0.00	Purchase 3 Medium-Heavy Duty Vehicles	$75,000.00	No
MS12029	Community Action Partnership of Or	11/2/2012	11/1/2018		$25,000.00	$14,850.00	Purchase 1 Medium-Heavy Duty Vehicle	$10,150.00	No
MS12031	Final Assembly, Inc.	11/2/2012	11/1/2018		$100,000.00	$29,201.40	Purchase 4 Medium-Heavy Duty Vehicles	$70,798.60	No
MS12033	Mike Diamond/Phace Management	12/22/2012	12/21/2018		$500,000.00	$21,735.00	Purchase 20 Medium-Heavy Duty Vehicles	$478,265.00	No
MS12034	Ware Disposal Company, Inc.	11/2/2012	11/1/2018	11/1/2020	$133,070.00	$74,763.00	Purchase 8 Medium-Heavy Duty Vehicles	$58,307.00	No

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
MS12060	City of Santa Monica	4/4/2014	8/3/2017		$500,000.00	$0.00	Transit-Oriented Bicycle Sharing Program	$500,000.00	No
MS12061	Orange County Transportation Autho	3/14/2014	3/13/2017		$224,000.00	$81,604.80	Transit-Oriented Bicycle Sharing Program	$142,395.20	No
MS12064	Anaheim Transportation Network	3/26/2013	12/31/2014		$127,296.00	$46,944.56	Implement Anaheim Circulator Service	$80,351.44	No
MS12067	Leatherwood Construction, Inc.	11/8/2013	3/7/2017		$122,719.00	$0.00	Retrofit Six Vehicles w/DECS - Showcase III	$122,719.00	No
MS12072	99 Cents Only Stores	4/5/2013	9/4/2019		$100,000.00	$0.00	Construct New CNG Station	$100,000.00	No
MS12073	FirstCNG, LLC	7/27/2013	12/26/2019		$150,000.00	$0.00	Construct New CNG Station	$150,000.00	No
MS12075	CR&R Incorporated	7/27/2013	1/26/2021		$100,000.00	$0.00	Expansion of Existing CNG Infrastructure	$100,000.00	No
MS12076	City of Ontario	3/8/2013	4/7/2015		$75,000.00	$0.00	Maintenance Facilities Modification	$75,000.00	No
MS12077	City of Coachella	6/14/2013	6/13/2020		$225,000.00	$0.00	Construct New CNG Station	$225,000.00	No
MS12078	Penske Truck Leasing Co., L.P.	1/7/2014	1/6/2016		$75,000.00	$0.00	Maintenance Facility Modifications - Vernon	$75,000.00	No
MS12079	Penske Truck Leasing Co., L.P.	1/7/2014	1/6/2016		$75,000.00	$0.00	Maintenance Facility Modifications - Boyle H	$75,000.00	No
MS12080	City of Pasadena	11/8/2013	8/7/2020		$225,000.00	$0.00	Expansion of Existing CNG Infrastructure	$225,000.00	No
MS12081	Penske Truck Leasing Co., L.P.	1/7/2014	1/6/2016		$75,000.00	$0.00	Maintenance Facility Modifications - Santa A	$75,000.00	No
MS12082	City of Los Angeles, Bureau of Sanit	11/20/2013	2/19/2021		$175,000.00	$0.00	Install New CNG Infrastructure	$175,000.00	No
MS12084	Airport Mobil Inc.	12/6/2013	5/5/2020		$150,000.00	$0.00	Install New CNG Infrastructure	$150,000.00	No
MS12086	SuperShuttle International, Inc.	3/26/2013	3/25/2019		$225,000.00	$202,500.00	Purchase 23 Medium-Heavy Duty Vehicles	$22,500.00	No
MS12087	Los Angeles County MTA	8/29/2013	11/28/2015		$125,000.00	$125,000.00	Implement Rideshare Incentives Program	$0.00	Yes
MS12088	Orange County Transportation Autho	12/6/2013	3/5/2016		$125,000.00	$0.00	Implement Rideshare Incentives Program	$125,000.00	No
MS12089	Riverside County Transportation Co	10/18/2013	9/17/2015		$250,000.00	$0.00	Implement Rideshare Incentives Program	$250,000.00	No
MS12Hom	Mansfield Gas Equipment Systems				$296,000.00	$0.00	Home Refueling Apparatus Incentive Progra	$296,000.00	No
Total: 54									
Pending Execution Contracts									
MS12083	Brea Olinda Unified School District				$59,454.00	$0.00	Install New CNG Infrastructure	$59,454.00	No
Total: 1									
Declined/Cancelled Contracts									
ML12038	City of Long Beach Public Works				$26,000.00	$0.00	Electric Vehicle Charging Infrastructure	$26,000.00	No
ML12040	City of Duarte Transit				$30,000.00	$0.00	One Heavy-Duty Nat. Gas Vehicle	$30,000.00	No
ML12044	County of San Bernardino Public Wo				$250,000.00	$0.00	Install New CNG Station	$250,000.00	No
ML12053	City of Mission Viejo				$60,000.00	$0.00	EV Charging Infrastructure	$60,000.00	No
MS12007	WestAir Gases & Equipment				$100,000.00	$0.00	Construct New Limited-Acess CNG Station	$100,000.00	No
MS12030	Complete Landscape Care, Inc.				$150,000.00	$0.00	Purchase 6 Medium-Heavy Duty Vehicles	$150,000.00	No
MS12070	Valley Music Travel/CID Entertainme				$99,000.00	$0.00	Implement Shuttle Service to Coachella Mus	$99,000.00	No
Total: 7									
Closed Contracts									
ML12037	Coachella Valley Association of Gov	3/14/2013	3/13/2014		$250,000.00	$250,000.00	Street Sweeping Operations	$0.00	Yes
ML12056	City of Cathedral City	3/26/2013	5/25/2014		$25,000.00	$25,000.00	Regional Street Sweeping Program	$0.00	Yes
MS12002	Orange County Transportation Autho	9/7/2012	4/30/2013		$342,340.00	$333,185.13	Express Bus Service to Orange County Fair	$9,154.87	Yes

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
MS12003	Orange County Transportation Autho	7/20/2012	2/28/2013		$234,669.00	$167,665.12	Implement Metrolink Service to Angel Stadiu	$67,003.88	Yes
MS12005	USA Waste of California, Inc.	10/19/2012	8/18/2013		$75,000.00	$75,000.00	Vehicle Maintenance Facility Modifications	$0.00	Yes
MS12006	Waste Management Collection & Re	10/19/2012	8/18/2013		$75,000.00	$75,000.00	Vehicle Maintenance Facility Modifications	$0.00	Yes
MS12012	Rim of the World Unified School Dist	12/20/2012	5/19/2014		$75,000.00	$75,000.00	Vehicle Maintenance Facility Modifications	$0.00	Yes
MS12059	Orange County Transportation Autho	2/28/2013	12/27/2014		$75,000.00	$75,000.00	Maintenance Facilities Modifications	$0.00	No
MS12062	Fraser Communications	12/7/2012	5/31/2014		$998,669.00	$989,218.49	Develop & Implement "Rideshare Thursday"	$9,450.51	Yes
MS12065	Orange County Transportation Autho	7/27/2013	11/30/2013		$43,933.00	$14,832.93	Ducks Express Service to Honda Center	$29,100.07	Yes
MS12068	Southern California Regional Rail Au	3/1/2013	9/30/2013		$57,363.00	$47,587.10	Implement Metrolink Service to Autoclub Sp	$9,775.90	Yes
MS12069	City of Irvine	8/11/2013	2/28/2014		$45,000.00	$26,649.41	Implement Special Transit Service to Solar	$18,350.59	Yes
MS12085	Bear Valley Unified School District	4/25/2013	6/24/2014		$75,000.00	$75,000.00	Maintenance Facility Modifications	$0.00	Yes
Total: 13									
Open/Complete Contracts									
ML12039	City of Redlands	2/8/2013	10/7/2019		$90,000.00	$90,000.00	Three Heavy-Duty Nat. Gas Vehicles	$0.00	No
ML12042	City of Chino Hills	1/18/2013	3/17/2017		$87,500.00	$87,500.00	Expansion of Existing CNG Station	$0.00	Yes
ML12047	City of Orange	2/1/2013	1/31/2019		$30,000.00	$30,000.00	One Heavy-Duty Nat. Gas Vehicle	$0.00	No
ML12055	City of Manhattan Beach	3/1/2013	12/31/2018		$10,000.00	$10,000.00	One Medium-Duty Nat. Gas Vehicle	$0.00	Yes
MS12010	Murrieta Valley Unified School Distric	4/5/2013	9/4/2019		$242,786.00	$242,786.00	Construct New Limited-Access CNG Station	$0.00	No
MS12025	Silverado Stages, Inc.	11/2/2012	7/1/2018		$150,000.00	$150,000.00	Purchase Six Medium-Heavy Duty Vehicles	$0.00	Yes
MS12026	U-Haul Company of California	3/14/2013	3/13/2019		$500,000.00	$353,048.26	Purchase 23 Medium-Heavy Duty Vehicles	$146,951.74	Yes
MS12028	Dy-Dee Service of Pasadena, Inc.	12/22/2012	1/21/2019		$45,000.00	$40,000.00	Purchase 2 Medium-Duty and 1 Medium-He	$5,000.00	Yes
MS12032	Fox Transportation	12/14/2012	12/13/2018		$500,000.00	$500,000.00	Purchase 20 Medium-Heavy Duty Vehicles	$0.00	Yes
MS12035	Disneyland Resort	1/4/2013	7/3/2019		$25,000.00	$18,900.00	Purchase 1 Medium-Heavy Duty Vehicle	$6,100.00	Yes
MS12036	Jim & Doug Carter's Automotive/VS	1/4/2013	11/3/2018		$50,000.00	$50,000.00	Purchase 2 Medium-Heavy Duty Vehicles	$0.00	Yes
MS12058	Krisda Inc	4/24/2013	1/23/2019		$25,000.00	$25,000.00	Repower One Heavy-Duty Off-Road Vehicle	$0.00	Yes
MS12063	Custom Alloy Light Metals, Inc.	8/16/2013	2/15/2020		$100,000.00	$100,000.00	Install New Limited Access CNG Station	$0.00	Yes
MS12071	Transit Systems Unlimited, Inc.	5/17/2013	12/16/2018		$21,250.00	$21,250.00	Expansion of Existing CNG Station	$0.00	Yes
MS12074	Arcadia Unified School District	7/5/2013	9/4/2019		$175,000.00	$175,000.00	Expansion of Existing CNG Infrastructure	$0.00	No
Total: 15									

FY 2012-2014 Contracts

Open Contracts

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
ML14010	City of Cathedral City	8/13/2014	10/12/2015		$25,000.00	$0.00	Street Sweeping Operations	$25,000.00	No
ML14011	City of Palm Springs	6/13/2014	1/12/2016		$79,000.00	$0.00	Bicycle Racks, Bicycle Outreach & Educatio	$79,000.00	No
ML14014	City of Torrance	9/5/2014	12/4/2019		$56,000.00	$0.00	EV Charging Infrastructure	$56,000.00	No
ML14015	Coachella Valley Association of Gov	6/6/2014	9/5/2015		$250,000.00	$250,000.00	Street Sweeping Operations	$0.00	Yes
ML14019	City of Corona Public Works	12/5/2014	6/4/2020		$178,263.00	$0.00	EV Charging, Bicycle Racks, Bicycle Locker	$178,263.00	No
ML14020	County of Los Angeles Dept of Publi	8/13/2014	1/12/2018		$150,000.00	$0.00	San Gabriel BikeTrail Underpass Improvem	$150,000.00	No
ML14021	Riverside County Regional Park and	7/24/2014	12/23/2016		$250,000.00	$0.00	Bicycle Trail Improvements	$250,000.00	No
ML14028	City of Fullerton	9/5/2014	1/4/2022		$126,950.00	$0.00	Expansion of Exisiting CNG Infrastructure	$126,950.00	No
ML14029	City of Irvine	7/11/2014	6/10/2017		$90,500.00	$0.00	Bicycle Trail Improvements	$90,500.00	No
ML14031	Riverside County Waste Manageme	6/13/2014	12/12/2020		$90,000.00	$0.00	Purchase 3 H.D. CNG Vehicles	$90,000.00	No
ML14033	City of Irvine	7/11/2014	2/10/2021		$60,000.00	$0.00	Purchase 2 H.D. CNG Vehicles	$60,000.00	No
ML14034	City of Lake Elsinore	9/5/2014	5/4/2021		$56,700.00	$0.00	EV Charging Stations	$56,700.00	No
ML14049	City of Moreno Valley	7/11/2014	3/10/2021		$105,000.00	$0.00	One HD Nat Gas Vehicle, EV Charging, Bicy	$105,000.00	No
ML14050	City of Yucaipa	7/11/2014	9/10/2015		$84,795.00	$0.00	Installation of Bicycle Lanes	$84,795.00	No
ML14051	City of Brea	9/5/2014	1/4/2017		$450,000.00	$0.00	Installation of Bicycle Trail	$450,000.00	No
ML14054	City of Torrance	11/14/2014	4/13/2017		$350,000.00	$0.00	Upgrade Maintenance Facility	$350,000.00	No
ML14055	City of Highland	10/10/2014	3/9/2018		$500,000.00	$0.00	Bicycle Lanes and Outreach	$500,000.00	No
ML14056	City of Redlands	9/5/2014	5/4/2016		$125,000.00	$0.00	Bicycle Lanes	$125,000.00	No
ML14064	City of Claremont	7/11/2014	7/10/2020		$60,000.00	$0.00	Purchase Two Heavy-Duty Nat. Gas Vehicle	$60,000.00	No
ML14065	City of Orange	9/5/2014	8/4/2015		$10,000.00	$0.00	Electric Vehicle Charging Infrastructure	$10,000.00	No
ML14066	City of South Pasadena	9/12/2014	7/11/2016		$142,096.00	$0.00	Bicycle Trail Improvements	$142,096.00	No
ML14068	City of South Pasadena	9/12/2014	10/11/2015		$10,183.00	$0.00	Electric Vehicle Charging Infrastructure	$10,183.00	No
ML14072	City of Cathedral City	8/13/2014	1/12/2021		$136,000.00	$0.00	Medium & H.D. Vehicles, EV Charging, Bike	$136,000.00	No
MS14002	Orange County Transportation Autho	9/6/2013	4/30/2014		$576,833.00	$576,833.00	Clean Fuel Transit Service to Orange Count	$0.00	No
MS14004	Orange County Transportation Autho	9/24/2013	4/30/2014		$36,800.00	$35,485.23	Implement Express Bus Service to Solar De	$1,314.77	No
MS14005	Transit Systems Unlimited, Inc.	4/11/2014	2/28/2016		$515,200.00	$253,920.00	Provide Expanded Shuttle Service to Hollyw	$261,280.00	No
MS14007	Orange County Transportation Autho	6/6/2014	4/30/2015		$208,520.00	$0.00	Implement Special Metrolink Service to Ang	$208,520.00	No
MS14008	Orange County Transportation Autho	8/13/2014	5/31/2015		$601,187.00	$0.00	Implement Clean Fuel Bus Service to Orang	$601,187.00	No
MS14009	A-Z Bus Sales, Inc.	1/17/2014	12/31/2014	3/31/2015	$343,000.00	$250,000.00	Alternative Fuel School Bus Incentive Progr	$93,000.00	No
MS14042	Grand Central Recycling & Transfer	6/6/2014	9/5/2021		$150,000.00	$0.00	Expansion of Existing CNG Station	$150,000.00	No
MS14045	TIMCO CNG Fund I, LLC	6/6/2014	12/5/2020		$150,000.00	$0.00	New Public-Access CNG Station in Inglewoo	$150,000.00	No
MS14046	Ontario CNG Station Inc.	5/15/2014	5/14/2020		$150,000.00	$0.00	Expansion of Existing CNG Infrastructure	$150,000.00	No
MS14048	BusWest	3/14/2014	12/31/2014	3/31/2015	$878,850.00	$475,850.00	Alternative Fuel School Bus Incentive Progr	$403,000.00	No
MS14052	Arcadia Unified School District	6/13/2014	10/12/2020		$78,000.00	$0.00	Expansion of an Existing CNG Fueling Statio	$78,000.00	No

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
MS14057	Los Angeles County MTA	11/7/2014	10/6/2019		$1,250,000.00	$0.00	Implement Various Signal Synchronization P	$1,250,000.00	No
MS14058	Orange County Transportation Autho	11/7/2014	4/6/2016		$1,250,000.00	$0.00	Implement Various Signal Synchronization P	$1,250,000.00	No
MS14059	Riverside County Transportation Co	9/5/2014	3/4/2018		$939,625.00	$0.00	Implement Various Signal Synchronization P	$939,625.00	No
Total: 37									
Pending Execution Contracts									
ML14012	City of Santa Ana				$244,000.00	$0.00	EV Charging and 7 H.D. LPG Vehicles	$244,000.00	No
ML14013	City of Los Angeles, Bureau of Sanit				$3,840,000.00	$0.00	Purchase 128 H.D. Nat. Gas Vehicles	$3,840,000.00	No
ML14016	City of Anaheim				$380,000.00	$0.00	Purchase 2 H.D. Vehicles, Expansion of Exi	$380,000.00	No
ML14018	City of Los Angeles, Department of				$810,000.00	$0.00	Purchase 27 H.D. Nat. Gas Vehicles	$810,000.00	No
ML14022	County of Los Angeles Department o				$300,000.00	$0.00	Purchase 10 H.D. Nat. Gas Vehicles	$300,000.00	No
ML14023	County of Los Angeles Department o				$230,000.00	$0.00	Maintenance Fac. Modifications-Westcheste	$230,000.00	No
ML14024	County of Los Angeles Department o				$230,000.00	$0.00	Maintenance Fac. Modifications-Baldwin Par	$230,000.00	No
ML14025	County of Los Angeles Dept of Publi				$500,000.00	$0.00	Construct New CNG Station in Malibu	$500,000.00	No
ML14026	County of Los Angeles Dept of Publi				$500,000.00	$0.00	Construct New CNG Station in Castaic	$500,000.00	No
ML14027	County of Los Angeles Dept of Publi				$500,000.00	$0.00	Construct New CNG Station in Downey	$500,000.00	No
ML14030	County of Los Angeles Internal Servi				$425,000.00	$0.00	Bicycle Racks, Outreach & Education	$425,000.00	No
ML14032	City of Rancho Cucamonga				$226,770.00	$0.00	Expansion of Existing CNG Infras., Bicycle L	$226,770.00	No
ML14060	County of Los Angeles Internal Servi				$104,400.00	$0.00	Electric Vehicle Charging Infrastructure	$104,400.00	No
ML14061	City of La Habra				$60,000.00	$0.00	Purchase Two Heavy-Duty Nat. Gas Vehicle	$60,000.00	No
ML14062	City of San Fernando				$500,000.00	$0.00	Construct New CNG Fueling Station	$500,000.00	No
ML14067	City of Duarte Transit				$60,000.00	$0.00	Purchase Two Heavy-Duty Nat. Gas Vehicle	$60,000.00	No
ML14069	City of Beaumont				$200,000.00	$0.00	Construct New CNG Infrastructure	$200,000.00	No
ML14070	City of Rancho Cucamonga				$365,245.00	$0.00	Bicycle Trail Improvements	$365,245.00	No
ML14071	City of Manhattan Beach				$22,485.00	$0.00	Electric Vehicle Charging Infrastructure	$22,485.00	No
MS14001	Los Angeles County MTA				$1,227,450.00	$0.00	Clean Fuel Transit Service to Dodger Stadiu	$1,227,450.00	No
MS14035	Penske Truck Leasing Co., L.P.				$75,000.00	$0.00	Vehicle Maint. Fac. Modifications - Sun Valle	$75,000.00	No
MS14036	Penske Truck Leasing Co., L.P.				$75,000.00	$0.00	Vehicle Maint. Fac. Modifications - La Mirad	$75,000.00	No
MS14037	Penske Truck Leasing Co., L.P.				$75,000.00	$0.00	Vehicle Maint. Fac. Modifications - Carson	$75,000.00	No
MS14038	Penske Truck Leasing Co., L.P.				$75,000.00	$0.00	Vehicle Maint. Fac. Modifications - Fontana	$75,000.00	No
MS14039	Waste Management Collection and				$75,000.00	$0.00	Vehicle Maint. Fac. Modifications - Irvine	$75,000.00	No
MS14040	Waste Management Collection and				$75,000.00	$0.00	Vehicle Maint. Fac. Modifications - Santa An	$75,000.00	No
MS14041	USA Waste of California, Inc.				$175,000.00	$0.00	Limited-Access CNG Station, Vehicle Maint.	$175,000.00	No
MS14053	Upland Unified School District				$175,000.00	$0.00	Expansion of Existing CNG Infrastructure	$175,000.00	No
MS14072	San Bernardino Associated Govern				$1,250,000.00	$0.00	Implement Various Signal Synchronization P	$1,250,000.00	No
MS14073	Anaheim Transportation Network				$221,312.00	$0.00	Anaheim Resort Circulator Service	$221,312.00	No
MS14074	Midway City Sanitary District				$250,000.00	$0.00	Limited-Access CNG Station & Facility Modif	$250,000.00	No
MS14087	Orange County Transportation Autho				$239,645.00	$0.00	Implement Special Metrolink Service to Ang	$239,645.00	No

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
MS14088	Southern California Regional Rail Au				$83,960.00	$0.00	Special Metrolink Service to Autoclub Speed	$83,960.00	No
Total: 33									
Declined/Cancelled Contracts									
ML14063	City of Hawthorne				$32,000.00	$0.00	Expansion of Existng CNG Infrastructure	$32,000.00	No
MS14043	City of Anaheim				$175,000.00	$0.00	Expansion of Existing CNG Station	$175,000.00	No
Total: 2									
Closed Contracts									
MS14003	Orange County Transportation Autho	8/1/2013	4/30/2014	10/30/2014	$194,235.00	$184,523.00	Implement Metrolink Service to Angel Stadiu	$9,712.00	Yes
MS14047	Southern California Regional Rail Au	3/7/2014	9/30/2014		$49,203.00	$32,067.04	Special Metrolink Service to Autoclub Speed	$17,135.96	Yes
Total: 2									
Open/Complete Contracts									
MS14044	TIMCO CNG Fund I, LLC	5/2/2014	11/1/2020		$150,000.00	$150,000.00	New Public-Access CNG Station in Santa A	$0.00	Yes
Total: 1									

FY 2014-2016 Contracts

Cont.#	Contractor	Start Date	Original End Date	Amended End Date	Contract Value	Remitted	Project Description	Award Balance	Billing Complete?
Pending Execution Contracts									
MS14075	Fullerton Joint Union High School Di				$300,000.00	$0.00	Expansion of Existing CNG Infrastructure/M	$300,000.00	No
MS14076	Rialto Unified School District				$225,000.00	$0.00	New Public Access CNG Station	$225,000.00	No
MS14077	County Sanitation Districts of L.A. C				$175,000.00	$0.00	New Limited Access CNG Station	$175,000.00	No
MS14078	American Honda Motor Co., Inc.				$150,000.00	$0.00	New Public Access CNG Station	$150,000.00	No
MS14079	Waste Resources, Inc.				$100,000.00	$0.00	New Limited Access CNG Station	$100,000.00	No
MS14080	CR&R Incorporated				$249,954.00	$0.00	Expansion of Existing CNG Infrastructure/M	$249,954.00	No
MS14081	CR&R Incorporated				$175,000.00	$0.00	Expansion of Existing CNG Infrastructure/M	$175,000.00	No
MS14082	Pomona Valley Transfer Station				$150,000.00	$0.00	Expansion of Existing CNG Infrastructure	$150,000.00	No
MS14083	Hacienda La Puente Unified School				$175,000.00	$0.00	New Limited Access CNG Station	$175,000.00	No
MS14084	US Air Conditioning Distributors				$100,000.00	$0.00	Expansion of Existing CNG Infrastructure	$100,000.00	No
MS14085	Prologis, L.P.				$100,000.00	$0.00	New Limited Access CNG Station	$100,000.00	No
MS14086	San Gabriel Valley Towing I				$150,000.00	$0.00	New Public Access CNG Station	$150,000.00	No
MS14089	Enhanced Fleet Modernization Progr				$800,000.00	$0.00	Partnership with SCAQMD/EFMP	$800,000.00	No

Total: 13

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 20

REPORT: California Air Resources Board Monthly Meeting

SYNOPSIS: The California Air Resources Board met on January 29, 2015, in Sacramento. The following is a summary of this meeting.

RECOMMENDED ACTION:
Receive and file.

Judith Mitchell, Member
SCAQMD Governing Board

sm

The Air Resources Board's (ARB or Board) January meeting was held on January 29 in Sacramento at the California Environmental Protection Agency Headquarters Building. Key items presented are summarized below.

1. ARB's Program Priorities for 2015

The Executive Officer briefed the Board on ARB's priorities for 2015. The briefing detailed ARB's successes and next steps in continuing implementation of criteria pollutant and climate programs. 2015 will be a pivotal planning year which will help lay out the path to meeting mid-term and 2050 climate goals, achieving the PM2.5 and ozone standards, and reducing localized risk. To address these priorities, ARB is strengthening its operations by realigning resources, looking at the benefits of cross-sector plans and initiatives, and forming partnerships with local, state, federal and international agencies.

2. ARB Research to Support Sustainable Communities

The Board heard an overview of ARB's research program focused on supporting strategies to improve the sustainability of California's built environment. ARB's

research in this area includes projects on land use patterns, transportation infrastructure, and buildings. This work has informed local agencies on strategies to reduce carbon emissions from transportation as required by SB 375 and from buildings as required by the State green building code.

3. **GHG Quantification Determination for the Council of Fresno County Govts Regional Transportation Plan/Sustainable Community Strategy**

Staff presented its technical evaluation of the Council of Fresno County Governments' (FCOG) greenhouse gas determination for the 2014 Regional Transportation Plan/Sustainable Communities Strategy adopted by FCOG in June of 2014. The Board acted to accept FCOG determination that its 2014 Sustainable Communities Strategy (SCS), if implemented, would achieve the region's per capita greenhouse gas emissions reduction targets for 2020 and 2035. The 2014 SCS represents a shift away from the county's historic growth pattern of dispersed, auto-oriented development, and instead focuses on more inward facing development, multi-family housing and alternative modes of travel, with less emphasis on expanded road capacity.

4. **Report on Air Quality**

The Board was briefed on California's air quality progress. The report discussed on-going successes in meeting the federal health-based air quality standards for ozone and PM2.5. A key highlight is the South Coast Air Basin's attainment of the 15 ug/m3 annual PM2.5 standard in 2013, one year ahead of the 2014 attainment date. The report also described planning efforts for the more stringent ozone and particulate matter standards, and how the nature of the remaining air quality challenge will inform appropriate regional strategies in meeting these standards. Finally, the presentation discussed U.S. EPA's proposal to further strengthen the ozone standard, and potential new nonattainment areas.

Attachment
CARB January 29, 2015 Meeting Agenda

California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

January 29, 2015

Webcast

LOCATION:
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814
http://www.calepa.ca.gov/EPAbldg/location.htm

This facility is accessible by public transit. For transit information, call (916) 321-BUSS, website: http://www.sacrt.com
(This facility is accessible to persons with disabilities.)

TO SUBMIT WRITTEN COMMENTS ON AN AGENDA ITEM IN ADVANCE OF THE MEETING GO TO: http://www.arb.ca.gov/lispub/comm/bclist.php

Thursday
January 29, 2015
9:00 a.m.

DISCUSSION ITEMS:

Note: The following agenda items may be heard in a different order at the Board meeting.

Agenda Item #

15-1-1: Report to the Board on the Air Resources Board Program Priorities for 2015

Executive Officer Richard Corey will provide the Board with an overview of anticipated Air Resources Board priorities for 2015.

Staff Presentation

15-1-2: Report to the Board on the Air Resources Board Research to Support Sustainable Communities

Staff will present to the Board an overview of the Air Resources Board's research program focused on supporting voluntary strategies that seek to improve the sustainability of California's built environment, including land use patterns, transportation infrastructure, and buildings.

More Information *Staff Presentation*

15-1-3: Public Meeting to Consider the Greenhouse Gas Quantification Determination for the Council of Fresno County Governments Regional Transportation Plan/Sustainable Communities Strategy

The Board will consider action to accept or reject the Council of Fresno County Governments' (FCOG) determination that its 2014 Sustainable Communities Strategy, if implemented, would achieve the region's per capita greenhouse gas emissions reduction targets for 2020 and 2035. Staff will present its technical evaluation of FCOG's greenhouse gas determination for the 2014 Regional Transportation Plan/Sustainable Communities Strategy which was adopted by FCOG on June 26, 2014.

More Information *Staff Presentation*

15-1-4: Report to the Board on Air Quality

Staff will present to the Board an air quality progress report. This report will focus on current air quality as well as the progress made towards attainment of health-based air quality standards for ozone and PM2.5.

More Information *Staff Presentation*

CLOSED SESSION

The Board will hold a closed session, as authorized by Government Code section 11126(e), to confer with, and receive advice from, its legal counsel regarding the following pending or potential litigation, and as authorized by Government Code section 11126(a):

POET, LLC, et al. v. Corey, et al., Superior Court of California (Fresno County), Case No. 09CECG04850; plaintiffs' appeal, California Court of Appeal, Fifth District, Case No. F064045; California Supreme Court, Case No. S213394. [remanded to trial court].

Rocky Mountain Farmers Union, et al. v. Corey, U.S. District Court (E.D. Cal. Fresno), Case No. 1:09−CV−02234−LJO−DLB; ARB interlocutory appeal, U.S. Court of Appeals, Ninth Circuit, Case No. 09-CV-02234 [remanded to trial court].

American Fuels and Petrochemical Manufacturing Associations, et al. v. Corey, et al., U.S. District Court (E.D. Cal. Fresno), Case No. 1:10-CV-00163-AWI-GSA; ARB's interlocutory appeal, U.S. Court of Appeals, Ninth Circuit, Case No. 10-CV-00163 [remanded to trial court].

California Dump Truck Owners Association v. Nichols, U.S. District Court (E.D. Cal. Sacramento), Case No. 2:11-CV-00384-MCE-GGH; plaintiffs' appeal, U.S. Court of Appeals, Ninth Circuit, Case No. 13-15175.

Engine Manufacturers Association v. California Air Resources Board, Sacramento Superior Court, Case No. 34-2010-00082774; ARB's appeal, California Court of Appeal, Third District, Case No. C071891.

Truck and Engine Manufacturers Association v. California Air Resources Board, Sacramento Superior Court, Case No. 34-2013-00150733.

Alliance of Automobile Manufacturers v. California Air Resources Board; Sacramento Superior Court, Case No. 34-2013-00152974.

Citizens Climate Lobby and Our Children's Earth Foundation v. California Air Resources Board, San Francisco Superior Court, Case No. CGC-12-519554, plaintiffs' appeal, California Court of Appeal, First District, Case No. A138830.

California Chamber of Commerce et al. v. California Air Resources Board, Sacramento Superior Court, Case No. 34-2012-80001313; plaintiffs' appeal, California Court of Appeal, Third District, Case No. C075930.

Morning Star Packing Company, et al. v. California Air Resources Board, et al., Sacramento Superior Court, Case No. 34-2013-800001464; plaintiffs' appeal, California Court of Appeal, Third District, Case No. C075954.

Delta Construction Company, et al. v. United States Environmental Protection Agency, U.S. Court of Appeals, District of Columbia Circuit, Case No. 11-1428.

City of Los Angeles through Department of Water and Power v. California Air Resources Board, et al., Los Angeles Superior Court, Case No. BS140620 (transferred to Sacramento Superior Court, Case No. 34-2013-80001451-CU-WM-GDS).

Alliance for California Business v. Nichols et al., Glenn County Superior Court, Case No. 13CV01232.

Dalton Trucking, Inc. v. United States Environmental Protection Agency, U.S. Court of Appeals, District of Columbia Circuit, Case No. 13-1283.

Owner-Operator Independent Drivers Association Inc. et al. v. Richard W. Corey et al., U.S. District Court, (E.D. Cal. Fresno) Case No. 1:13-CV-01998-LJO-SAB (transferred by court to E.D.Cal. Sacramento, Case No. 2:14-CV-00186-MCE-AC).

John R. Lawson Rock & Oil, Inc. et al. v. California Air Resources Board et al., Fresno County Superior Court, Case No. 14-CECG01494.

Transportation Solutions Defense and Education Fund v. California Air Resoures Board, Fresno County Superior Court, Case No. 14CECG01788 (plaintiff's transfer to Sacramento Superior).

California Nozzle Specialists, Inc. v. California Air Resources Board, Los Angeles County Superior Court, Case No. BC564965.

OPPORTUNITY FOR MEMBERS OF THE BOARD TO COMMENT ON MATTERS OF INTEREST

Board members may identify matters they would like to have noticed for consideration at future meetings and comment on topics of interest; no formal action on these topics will be taken without further notice.

OPEN SESSION TO PROVIDE AN OPPORTUNITY FOR MEMBERS OF THE PUBLIC TO ADDRESS THE BOARD ON SUBJECT MATTERS WITHIN THE JURISDICTION OF THE BOARD

Although no formal Board action may be taken, the Board is allowing an opportunity to interested members of the public to address the Board on items of interest that are within the Board's jurisdiction, but that do not specifically appear on the agenda. Each person will be allowed a maximum of three minutes to ensure that everyone has a chance to speak.

TO ELECTRONICALLY SUBMIT WRITTEN COMMENTS ON AN AGENDA ITEM IN ADVANCE OF THE MEETING GO TO:

http://www.arb.ca.gov/lispub/comm/bclist.php

(Note: not all agenda items are available for electronic submittals of written comments.)

IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT THE CLERK OF THE BOARD:
1001 I Street, 23rd Floor, Sacramento, California 95814
(916) 322-5594
ARB Homepage: www.arb.ca.gov

SPECIAL ACCOMMODATION REQUEST

Consistent with California Government Code Section 7296.2, special accommodation or language needs may be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 7 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Consecuente con la sección 7296.2 del Código de Gobierno de California, una acomodación especial o necesidades lingüísticas pueden ser suministradas para cualquiera de los siguientes:

- Un intérprete que esté disponible en la audiencia
- Documentos disponibles en un formato alterno u otro idioma
- Una acomodación razonable relacionados con una incapacidad

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envié un fax a (916) 322-3928 lo más pronto posible, pero no menos de 7 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

SMOKING IS NOT PERMITTED AT MEETINGS OF THE CALIFORNIA AIR RESOURCES BOARD

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BOARD MEETING DATE: February 6, 2015 AGENDA NO. 21

REPORT: Status Report on Regulation XIII – New Source Review

SYNOPSIS: This report presents the federal preliminary determination of equivalency for January 2013 through December 2013. As such, it provides information regarding the status of Regulation XIII – New Source Review in meeting federal NSR requirements and shows that SCAQMD's NSR program is in preliminary compliance with applicable federal requirements from January 2013 through December 2013.

COMMITTEE: Stationary Source, January 23, 2015, Reviewed

RECOMMENDED ACTION:
Receive and file the attached report.

Barry R. Wallerstein, D.Env.
Executive Officer

MN:WCT:GT:DRH

SUMMARY

SCAQMD's NSR Rules and Regulations are designed to comply with federal and state Clean Air Act requirements and to ensure that emission increases from new and modified sources do not interfere with efforts to attain and maintain the federal and state air quality standards, while economic growth in the South Coast region is not unnecessarily impeded. Regulation XIII - New Source Review regulates and accounts for all emission changes (both increases and decreases) from the permitting of new, modified, and relocated stationary sources within SCAQMD, excluding NOx and SOx sources that are subject to Regulation XX – Regional Clean Air Incentives Market (RECLAIM)[1].

[1] While the RECLAIM program is different than command and control rules for NOx and SOx and it provides greater regulatory flexibility to businesses, its NSR requirements, as specified in Rule 2005, are designed to comply with the governing principles of NSR contained in the federal Clean Air Act (CAA) and the California State Health and Safety Code.

Rule 1315 – Federal New Source Review Tracking System, was most recently adopted by the Board on February 4, 2011 to maintain SCAQMD's ability to issue permits to major sources that require offsets, but obtain offset credits from the SCAQMD's Priority Reserve under Rule 1309.1, and/or that are exempt from offsets under SCAQMD Rule 1304. In addition, Rule 1315 requires that, commencing with calendar year 2010, and for each calendar year thereafter, the Executive Officer prepare a Preliminary Determination of Equivalency (PDE) and Final Determination of Equivalency (FDE) which cover NSR activities for twelve-month periods. The calendar year 2013 PDE and FDE are required to be reported to the SCAQMD Governing Board at the February and September 2015 Board meetings, respectively. Rule 1315 also requires the Executive Officer to aggregate and track offsets debited from and deposited to SCAQMD's offset accounts for specified periods between October 1, 1990 and December 31, 2005 and each calendar year from 2006 through 2030 for purpose of making periodic determinations of compliance. The last annual report submitted to the SCAQMD Board on September 5, 2014 presented the FDE for calendar year 2012 and demonstrated that SCAQMD's NSR program continued to meet the federal offset requirements for calendar year 2012.

This report, which presents the PDE covering the calendar year 2013 reporting period, demonstrates compliance with federal NSR requirements by establishing aggregate equivalence with federal offset requirements for sources that were not exempt from federal offset requirements, but were either exempt from offsets or obtained their offsets from SCAQMD pursuant to Regulation XIII.

The PDE for the calendar year 2013 is summarized in Table 1. Additionally, the projections of SCAQMD's federal offset account balances for January 2014 through December 2014 and January 2015 through December 2015, as specified and required pursuant to Rule 1315(e), are presented in Table 2. These results demonstrate that there were, and project that there will be, adequate offsets available to mitigate all applicable emission increases during these reporting periods. This report, therefore, demonstrates that, for calendar years 2013 through 2015, SCAQMD's NSR program continues to meet and is projected to meet federal offset requirements and is equivalent to those requirements on an aggregate basis[2]. Although the United States Environmental Protection Agency (U.S. EPA) designated the SCAQMD as attainment with the federal CO standard effective June 11, 2007, SCAQMD will continue to track and report CO accumulated credits and account balances for informational purposes only.

[2] SCAQMD's NSR program is deemed to be equivalent to federal offset requirements because SCAQMD's ending offset account balances remained positive, indicating there were adequate offsets during this reporting period.

Table 1
PDE for January 2013 through December 2013

DESCRIPTION	VOC	NOx	SOx	CO	PM10
2012 Actual Ending Balance[a] (ton/day)	**88.82**	**26.60**	**3.22**	**18.90**	**13.59**
2012 Discount of Credits for Surplus Adjustment[b] (ton/day)	0	-1.25	0	0	0
2013 Starting Balance (ton/day)	**88.82**	**25.35**	**3.22**	**18.90**	**13.59**
2013 Actual Total Debits[c] (lb/day)	-1013	-14	0	-15,957	0
2013 Actual Total Debits[c] (ton/day)	**-0.51**	**-0.01**	**0**	**-7.98**	**0**
2013 Preliminary Ending Balance[d] (ton/day)	**88.31**	**25.34**	**3.22**	**10.92**	**13.59**

[a] "2012 Actual Ending Balance" is from Table 1 of the 2012 FDE report dated September 5, 2014.

[b] This adjustment is surplus at the time of use discount, which is also discussed in Rule 1315(c)(4).

[c] For an explanation of the sources of debits please refer to page 7 of this report, as well as Rule 1315(c) and the February 4, 2011 Rule 1315 staff report.

[d] "2013 Preliminary Ending Balance" equals the "2012 Actual Ending Balance" reduced by any surplus adjustments and the sum of actual debits. 2013 credits will be added in the Final Determination of Equivalency to be presented in September 2015.

Table 2
Projections of SCAQMD's Federal Offset Account Balances for January 2014 through December 2014, and January 2015 through December 2015

DESCRIPTION	VOC	NOx	SOx	CO	PM10
2013 Preliminary Ending Balance[a] (ton/day)	**88.31**	**25.34**	**3.22**	**10.92**	**13.59**
2014 Projected Discount of Credits for Surplus Adjustment[b] (ton/day)	-0.45	-1.28	0	-0.09	-0.02
2014 Projected Starting Balance (ton/day)	**87.86**	**24.06**	**3.22**	**10.83**	**13.57**
2014 Total Projected Credits[c] (lb/day)	11,680	2,420	460	4,220	1,680
2014 Total Projected Debits[c] (lb/day)	-520	-640	0	0	-180
2014 Sum of Projected Credits/Debits[c] (lb/day)	11,160	1,780	460	4,220	1,500
2014 Sum of Projected Credits/Debits[c] (ton/day)	**5.58**	**0.89**	**0.23**	**2.11**	**0.75**
2014 Projected Ending Balance[d] (ton/day)	**93.44**	**24.95**	**3.45**	**12.94**	**14.32**
2015 Projected Discount of Credits for Surplus Adjustment[b] (ton/day)	-0.47	-1.26	0	-0.11	-0.02
2015 Projected Starting Balance (ton/day)	**92.97**	**23.69**	**3.45**	**12.83**	**14.30**
2015 Total Projected Credits[c] (lb/day)	11,680	2,420	460	4,220	1,680
2015 Total Projected Debits[c] (lb/day)	-520	-640	0	0	-180
2015 Sum of Projected Credits/Debits[c] (lb/day)	11,160	1,780	460	4,220	1,500
2015 Sum of Projected Credits/Debits[c] (ton/day)	**5.58**	**0.89**	**0.23**	**2.11**	**0.75**
2015 Projected Ending Balance[d] (ton/day)	**98.55**	**24.58**	**3.68**	**14.94**	**15.05**

[a] "2013 Preliminary Ending Balance" is as shown in Table 1.

[b] This adjustment is surplus at the time of use discount, which is also discussed in Rule 1315(c)(4).

[c] For an explanation of the sources of debits and credits please refer to page 7 of this report, as well as Rule 1315(c) and the Rule 1315 staff report. Credits are shown as positive and debits as negative, while the sum of credits/debits are shown as positive or negative, as appropriate.

[d] "2014 Projected Ending Balance" equals the "2013 Projected Ending Balance" plus any projected surplus adjustments and the sum of projected credits and projected debits.

[e] "2015 Projected Ending Balance" equals the "2014 Projected Ending Balance" plus any projected surplus adjustments and the sum of projected credits and projected debits.

BACKGROUND

SCAQMD originally adopted its New Source Review Rules and Regulations (NSR program) in 1976. U.S. EPA approved SCAQMD's NSR program into California's State Implementation Plan (SIP) initially on January 21, 1981 (46FR5965) and again on December 4, 1996 (61FR64291). U.S. EPA approved SCAQMD's May 3, 2002 Rule 1309.1 amendments into the SIP on June 19, 2006 (71FR35157). The original program has evolved into the current version of the Regulation XIII rules in response to federal and state legal requirements and the changing needs of the local environment and economy. Specific amendments to the NSR rules were adopted by SCAQMD's Board on December 6, 2002 to facilitate and provide additional options for credit generation and use. Rule 1315 was adopted and re-adopted on September 8, 2006 and August 3, 2007, respectively. Rule 1309.1 was amended and replaced on September 8, 2006 and August 3, 2007, respectively. On November 3, 2008, in response to a lawsuit filed by a group of environmental organizations, a California State Superior Court Judge in the County of Los Angeles invalidated the August 3, 2007 adopted Rule 1315 and amendments to Rule 1309.1, and prohibited SCAQMD from taking any action to implement Rule 1315 or the amendments to Rule 1309.1 until it had prepared a new environmental assessment under the California Environmental Quality Act (CEQA). On February 4, 2011 SCAQMD adopted a revised and enhanced version of Rule 1315, which included a new CEQA assessment. U.S. EPA has approved Rule 1315 (May 25, 2012; 77 FR31200) but that approval is currently under litigation.

One element of SCAQMD's NSR program design is to offset emission increases in a manner at least equivalent to federal and state statutory NSR requirements. To this end, SCAQMD's NSR program implements the federal and state statutory requirements for NSR and ensures that construction and operation of new, relocated, and modified stationary sources does not interfere with progress towards attainment of the National and State Ambient Air Quality Standards. SCAQMD's computerized emission tracking system is utilized to demonstrate equivalence with federal and state offset requirements on an aggregate basis. Specific NSR requirements of federal law are presented below.

Federal Law

The NSR requirements of federal law vary with respect to the area's attainment status and classification. Based on their classification, the South Coast Air Basin (SOCAB) and Salton Sea Air Basin (SSAB) must comply with the requirements for extreme and severe non-attainment areas, respectively, for ozone precursors (*i.e.*, VOC and NOx). During all or part of the equivalency period, both the SOCAB and the SSAB complied with the requirements for serious non-attainment areas for PM10 and its precursors (i.e.,

VOC, NOx and SOx)[3]. SSAB is considered attainment for CO. Although effective June 11, 2007, U.S. EPA designated the SOCAB as attainment with federal CO standards, SCAQMD will continue to track and report CO accumulated credits and account balances for informational purposes only. Both SOCAB and SSAB are considered attainment for SO_2 and NO_2, however SOx and NOx are precursors to pollutants for which both SOCAB and SSAB are designated as non-attainment[4]. The Mojave Desert Air Basin (MDAB) is currently classified as moderate non-attainment for ozone precursors (*i.e.,* VOC and NOx), and as attainment for NOx, SOx, and CO. Federal law requires the use of LAER and offsets for emissions of nonattainment pollutants (or their precursors) for new, modified, and relocated stationary sources, when the source is considered a major stationary source[5] for the nonattainment pollutants (or their precursors). Federal law requires the use of Lowest Achievable Emission Rate (LAER) and offsets for new, modified, and relocated major stationary sources. This report demonstrates compliance with the federal NSR offsets requirements.

OVERVIEW OF ANALYSIS METHODOLOGY

The two most important elements of federal non-attainment NSR requirements are LAER and emission offsetting for major sources. As set forth in SCAQMD's *Best Available Control Technology (BACT) Guidelines*, SCAQMD's BACT requirements are at least as stringent as federal LAER for major sources. Furthermore, the NSR emission offset requirements that SCAQMD implements through its permitting process ensure that sources provide emission reduction credits (ERCs) to offset their emission increases in compliance with federal requirements. As a result, these sources each comply with federal offset requirements by providing their own ERCs. However, certain sources are exempt from SCAQMD's offset requirements pursuant to Rule 1304 or qualify for offsets from SCAQMD's Community Bank (applications received between October 1, 1990 and February 1, 1996 only) or Priority Reserve, both pursuant to Rule 1309.1. SCAQMD has determined that providing offset exemptions and the Priority Reserve (as

[3] As of July 26, 2013, SOCAB was redesignated as attainment for the federal 24-hour PM10 standard and U.S. EPA approved a PM10 maintenance plan; however, Rule 1303 still requires offsets for PM10 since SOCAB is considered non-attainment for state PM10 Ambient Air Quality Standards, so that pollutant continues to be tracked. Although the Clean Air Act no longer requires offsets for PM10 major sources in the SOCAB. PM2.5 is not covered by Rule 1315 or Rule 1304 and is subject to its own NSR Rule, 1325.

[4] SOx is a precursor to PM10 and NOx is a precursor to both PM10 and ozone.

[5] The major source thresholds for SOCAB, SSAB and MDAB, based on their attainment status during the calendar year 2007 through 2010 reporting periods, are summarized below:

Pollutant	SOCAB	SSAB	MDAB
VOC	10 ton/year	25 ton/year	100 ton/year
NOx	10 ton/year	25 ton/year	100 ton/year
SOx	100 ton/year	100 ton/year	100 ton/year
PM10	70 ton/year	70 ton/year	100 ton/year
CO	50 ton/year	100 ton/year	100 ton/year

well as the previously-administered Community Bank) is important to the NSR program and the local economy while encouraging installation of BACT. Therefore, SCAQMD has assumed the responsibility of providing the necessary offsets for exempt sources, the Priority Reserve, and the Community Bank. This report examines deposits to and withdrawals from SCAQMD's emission offset accounts during calendar year 2013 and demonstrates programmatic equivalence on an aggregate basis with federal emission offset requirements for the sources exempt from providing offsets and the sources that receive offsets from the Priority Reserve or the Community Bank.

SCAQMD's Offset Accounts

For the purposes of this report, federal debit and credit accounting for SCAQMD's offset accounts was conducted pursuant to the same procedures previously agreed to by U.S. EPA and as delineated in Rule 1315 and described in the staff report. Each of the pollutants subject to offset requirements and covered by Rule 1315 has its own federal offset account. SCAQMD's NSR program is considered to provide equivalent or greater offsets of emissions as required by federal requirements for each subject pollutant provided the balance of offsets left in SCAQMD's federal offset account for each pollutant remains positive, indicating that there were adequate offsets available.

Debit Accounting

SCAQMD tracks all emission increases that are offset through the Priority Reserve or the Community Bank, as well as all increases that are exempt from offset requirements pursuant to Rule 1304 – Exemptions. These increases are all debited from SCAQMD's federal offset accounts when they occur at federal major sources. For federal equivalency demonstrations, SCAQMD uses an offset ratio of 1.2-to-1.0 for extreme non-attainment pollutants (ozone and ozone precursors, *i.e.*, VOC and NOx) and uses 1.0-to-1.0 for all other non-attainment pollutants (non-ozone precursors, *i.e.*, SOx, CO, and PM10) to offset any such increases. That is, 1.2 pounds are deducted from SCAQMD's offset accounts for each pound of maximum allowable permitted potential to emit VOC or NOx increase at a federal source and 1.0 pound is deducted for each pound of maximum allowable permitted potential to emit SOx, CO, or PM10 at a federal source. A more detailed description of federal debit accounting is provided in the Rule 1315 staff report and Rule 1315(c)(2).

Credit Accounting

When emissions from a permitted source are permanently reduced (*e.g.*, installation of control equipment, removal of the source) and the emission reduction is not required by rule or law and is not called for by an AQMP control measure that has been assigned a

target implementation date[6], the permit holder may apply for ERCs for the pollutants reduced. If the permit holder for the source generating the emission reduction had previously received offsets from SCAQMD or has a "positive NSR balance" (*i.e.*, pre-1990 net emission increase), the quantity of SCAQMD offsets used or the amount of the positive NSR balance is subtracted from the reduction and "paid back" to SCAQMD's accounts prior to issuance of an ERC pursuant to Rule 1306. In certain other cases, permit holders do not always submit applications to claim ERCs or do not qualify to obtain ERCs for their equipment shutdowns or other eligible emission reductions. These unclaimed reductions are referred to as "orphan shutdowns" and are deposited in SCAQMD's offset accounts. ERCs provided as offsets by major sources in excess of the applicable federally-required offset ratio and all ERCs provided as offsets by minor sources not subject to federal offset requirements are also deposited in SCAQMD's federal offset accounts. A more detailed description of federal credit accounting is provided in Rule 1315(c)(3)(A) and its staff report.

DETERMINATION OF EQUIVALENCY WITH FEDERAL OFFSET REQUIREMENTS

The federal offset requirements PDE for calendar year 2013 and the projections for calendar years 2014 and 2015 are summarized in Tables 1, and 2, respectively. The detailed listing of actual final withdrawals, deposits, and sum of withdrawals and deposits are shown in Tables A and B of Attachment I to this letter.

These account balances, shown in Tables A and B reflect the tracking sequence described under Rule 1315(c)(5).

CONCLUSIONS

The analysis presented in this report demonstrates the following:

- For calendar year 2013, SCAQMD's NSR program provides equivalent offsets to those required by federal NSR requirements and is at least preliminarily equivalent to the federal requirements on an aggregate basis. This conclusion is based on the fact that the preliminary ending offset account balances for the calendar year reporting period, as shown in Table 1, remained positive for all pollutants.

- SCAQMD's projected offset account balances for 2014 and 2015 are projected to remain positive. This means that the sum of the estimated deposits to and withdrawals from SCAQMD's offset accounts during 2014 and 2015 are projected to remain positive.

[6] Refer to Rule 1309(b) for a complete explanation of eligibility requirements.

ATTACHMENTS

Attachment I – Detailed listing of actual debits, preliminary credits, and sum of debits and credits

ATTACHMENT I

Detailed listing of actual final debits, preliminary credits, and sum of debits and credits

Table A
Total Actual Debits from SCAQMD's Federal Offset Accounts
(January 2013 through December 2013)

DISTRICT OFFSETS USED	VOC	NOx	SOx	CO	PM10
Priority Reserve (lb/day)	-18	-10	0	0	0
Community Bank (lb/day)	0	0	0	0	0
Rule 1304 Exemptions (lb/day)	-826	-2	0	-15,957	0
Sum Total of SCAQMD Offsets (lb/day)	-844	-12	0	-15,957	0
1.2-to-1.0 Offset Ratio (lb/day)	-169	-2	N/A	N/A	N/A
Total Actual Debits to SCAQMD Account (lb/day)	**-1013**	**-14**	**0**	**-15,957**	**0**
Total Actual Debits to SCAQMD Account (ton/day)	**-0.51**	**-0.01**	**0**	**-7.98**	**0**

Table B
Sum of Preliminary Credits/Debits Activities in SCAQMD's Federal Offset Accounts
(January 2013 through December 2013)

	VOC	NOx	SOx	CO	PM10
Total Actual Debits* (lb/day)	-1,013	-14	0	-15,957	0
Total Actual Credits* (lb/day)	0	0	0	0	0
Sum of Actual Debits(-)/Credits(+)* (lb/day)	-1,013	-14	**0**	**-15,957**	**0**
Sum of Actual Debits(-)/Credits(+)* (ton/day)	**-0.51**	**-0.01**	**0**	**-7.98**	**0**

* Debits are shown as negative and Credits as positive, while their sum is shown as negative or positive, as appropriate. No credits are accounted for in the preliminary determination of equivalency analysis; they will be presented in the Final Determination of Equivalency due in September 2015.

Back to Agenda

BOARD MEETING DATE: February 6, 2015 AGENDA NO. 22

PROPOSAL: Supplement to 24-hour PM2.5 State Implementation Plan for South Coast Air Basin

SYNOPSIS: The purpose of this Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin is to demonstrate attainment of the 2006 24-hour PM2.5 National Ambient Air Quality Standard by 2015 under Clean Air Act, Title 1, Part D, Subpart 4, along with updates to the transportation conformity budgets, analysis of Reasonably Available Control Measures/Reasonably Available Control Technology, control measure commitments submitted in the 2012 AQMP, and other Subpart 4 requirements.

COMMITTEE: Mobile Source Committee, January 23, 2015, Reviewed

RECOMMENDED ACTIONS:
Adopt the attached resolution:
1. Determining that the Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin is exempt from the requirements of CEQA; and
2. Approving the attached Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin for Submittal into the SIP.

Barry R. Wallerstein, D.Env.
Executive Officer

BB EC:PF:MK

Background

The 2012 AQMP was approved by the SCAQMD Board in December 2012, with additional amendments approved in February 2013, and was subsequently submitted to CARB and the U.S. EPA for inclusion into the SIP. That plan demonstrated projected attainment of the 2006 24-hour PM2.5 National Ambient Air Quality Standards (NAAQS) (35 $\mu g/m^3$) by 2014. However, a recent court decision (*Natural Res. Def. Council v. EPA*, 706 F.3d 428 (D.C. Cir. 2013)) compels U.S. EPA to evaluate the 24-

hour PM2.5 SIP under CAA, Title 1, Part D, Subpart 4 (hereafter "Subpart 4") requirements specific to particulate matter, in addition to the general planning provisions of Subpart 1 that were previously used for PM2.5 SIPs. Subpart 4 provides for an attainment year of 2015 for "moderate" areas, one year later than the attainment year in the 2012 AQMP. Furthermore, preliminary ambient air quality data suggests that meeting the 2006 24-hour PM2.5 NAAQS (35 µg/m^3) by the end of 2014 is not likely, largely due to unusually extreme drought conditions in the Basin. In addition, Subpart 4 Section 189(e) necessitates that control requirements applicable for major PM2.5 sources shall also apply to major sources of PM2.5 precursors unless it is determined by U.S. EPA to not be a significant contributor to PM2.5. PM2.5 has four major precursors, other than direct PM2.5 emissions, that contribute to the development of the ambient PM2.5: nitrogen oxide (NOx), sulfur oxides (SOx), volatile organic compounds (VOC), and ammonia.

It should be noted that U.S. EPA has proposed to find that the former 24-hour PM2.5 NAAQS (65 µg/m3) has been attained, along with the previous annual PM2.5 NAAQS of 15 µg/m3 (79, FR, 72999, Dec 9, 2014). However, this Supplement relates to the most recent 24-hour PM2.5 NAAQS of 35 µg/m^3. Attainment of the 2012 annual PM2.5 NAAQS of 12 µg/m^3 will be addressed in the upcoming 2016 AQMP.

Proposal

SCAQMD staff is proposing to supplement the previous 24-hour PM2.5 SIP submittal to address Subpart 4 provisions and requirements with the following elements that are included in this Supplement:

- Demonstration of attainment of the 24-hour PM2.5 NAAQS by 2015 with a discussion of the effects of the drought on the attainment date as weight of evidence;
- Provide new transportation conformity budgets for 2015;
- Updated RACM/RACT analysis;
- Demonstration of compliance with CAA Subpart 4, Section 189(e) that applies to PM2.5 precursors, such as VOC and ammonia, and other precursor requirements; and
- Updated list of PM2.5 control measure commitments.

Air Quality Management Plan (AQMP) and Legal Mandates

The 2012 AQMP included the following specific elements:

- Attainment demonstration of the 2006 24-hour PM2.5 NAAQS for 2014;
- A RACM/RACT analysis;
- 2014 transportation conformity budgets; and
- Control strategy including emission reduction commitments with adoption and implementation dates.

Since the SCAQMD Board approval of the 2012 AQMP in December 2012 with amendments in February 2013, two PM2.5 control measures, BCM-01 (Further Reductions from Residential Wood Burning Devices) and BCM-02 (Further Reductions from Open Burning), were adopted in the form of amendments to Rules 445 (Wood Burning Devices) and 444 (Open Burning), respectively. Together, these amendments generated a total of 11.7 tons of PM2.5 per day reductions on an episodic basis. These emission reductions were the only emission reduction commitments needed in the 2012 AQMP to meet the 2006 24-hour NAAQS in 2014. The only other emission reduction commitment in the 2012 PM2.5 SIP was control measure CMB-01 (Further NOx Reductions from RECLAIM) which was submitted as a contingency measure only. This control measure is anticipated to be considered by the SCAQMD Board in the first half of 2015.

Potential Outcomes and Paths Forward

Despite the 2015 attainment demonstration mentioned above, there remains considerable uncertainty in the PM2.5 monitoring results for 2014 and the meteorological conditions and frequency of rainfall that will occur in 2015. In order to demonstrate attainment the 98th percentile of the 2015 24-hr PM2.5 readings at Mira Loma has to be significantly below the standard of 35.4 ug/m3 to compensate for high exceedances caused by the drought in 2013 and 2014, achieving a 3-year average design value at or below the standard. Although additional emissions reductions are expected in 2015, attainment of the standard, given the variability of weather conditions, remains far from certain. Acknowledging this uncertainty, there are several potential outcomes and pathways for the Basin's attainment status under the Clean Air Act depending on the actual certified air quality monitoring results for 2014 and 2015.

- 24-hour PM2.5 data at Mira Loma for 2014 and 2015 is clean enough to attain the standard based on a three-year (2013-2015) average design value. The Basin could then be re-designated as attainment for this PM2.5 standard

- The three-year average design value at Mira Loma does not show attainment in 2015, but the 98th percentile of the 24-hour PM2.5 data at Mira Loma for the single year 2015 is below 35.4 µg/m^3. Under CAA Subpart 4 provisions, if this air quality condition is met, and all PM2.5 SIP commitments have been satisfied, then the Basin is eligible for a one-year attainment date extension to 2016. A second one-year extension to 2017, if the same conditions are met in 2016, is also possible.

- The three-year average design value at Mira Loma does not show attainment in 2015 and the 98th percentile of the 24-hour PM2.5 data at Mira Loma for the single year 2015 is above 35.4 µg/m^3. Under Subpart 4 of the CAA, upon U.S. EPA's determination that the Basin failed to attain the standard by the

attainment date, the Basin would be automatically reclassified from a "moderate" nonattainment area to a "serious" non-attainment area. The new attainment deadline would be 2019, and more stringent "serious" area requirements would apply, including requirements to implement Best Available Control Measures and a lower major source threshold (70 tons per year vs. the current 100 tons per year). A full analysis for implementation of these requirements and other control measures to ensure attainment as expeditiously as practicable would be included in the 2016 AQMP, which is also addressing the annual PM2.5 standard.

California Environmental Quality Act (CEQA)
SCAQMD staff concludes that because the Supplement is not proposing to add new or delete any control measures that have the potential to have a direct or indirect adverse impact on the environment but merely presents updated analyses and other changes that do not have the potential to cause a direct or indirect adverse impact on the environment, the project is exempt under the requirements of CEQA, pursuant to CEQA Guidelines § 15061(b)(3).

Socioeconomic Analysis
No socioeconomic impact assessment is required because the proposed amendments do not add or delete control measures from the previously adopted 2012 AQMP, therefore do not "significantly affect air quality or emissions limitations." (Health & Safety Code Section 40440.8(a)).

Resource Impacts
The action would be implemented using existing staff resources committed for the 2012 AQMP implementation and is not expected to impose any significant burden.

Attachments
A. Resolution
B. Supplement to 24-hour PM2.5 State Implementation Plan (SIP) for South Coast Air Basin
C. CEQA Notice of Exemption

ATTACHMENT A

RESOLUTION

A Resolution of the South Coast Air Quality Management District Governing Board (SCAQMD) Governing Board approving the Supplement to the 24-hour PM2.5 State Implementation Plan (SIP) for the South Coast Air Basin and Submittal into the SIP.

A Resolution of the SCAQMD determining that the Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin is exempt from the requirements of the California Environmental Quality Act (CEQA).

WHEREAS, the 2012 Air Quality Management Plan (AQMP) was designed to address the PM2.5 SIP requirements of the federal Clean Air Act for the South Coast Air Basin (Los Angeles County, Orange County, Riverside and San Bernardino County); and

WHEREAS, the 2012 AQMP was approved by the SCAQMD Governing Board in December 2012 and AQMP amendments approved in February 2013, then subsequently submitted to the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (U.S. EPA) for inclusion into the SIP; and

WHEREAS, due to a recent court decision, approval of the 24-hour PM2.5 portion of the 2012 AQMP is now subject to Clean Air Act (CAA) Subpart 4 requirements that provide for attainment of 2006 24-hour PM2.5 National Ambient Air Quality Standard (NAAQS) (35 $\mu g/m^3$) by 2015, one year later than the attainment year in the 2012 AQMP; and

WHEREAS, the CAA Subpart 4 Section 189(e) necessitates that control requirements applicable for major PM2.5 sources shall also apply to major sources of PM2.5 precursors unless those sources do not contribute significantly to nonattainment; and

WHEREAS, the ambient air quality data suggests that meeting the 2006 24-hour PM2.5 NAAQS by the end of 2014 is not likely, largely due to unusually extreme drought conditions in the Basin; and

WHEREAS, the purpose of this Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin (Supplement) is to demonstrate attainment of the 2006 24-hour PM2.5 NAAQS by 2015 under CAA Subpart 4 as well as provide new transportation conformity budgets, updated analysis of Reasonably Available Control Measures (RACM)/ Reasonably Available Control Technology (RACT), updated control measure

commitments from those submitted in the 2012 AQMP, and demonstrate compliance with other Subpart 4 requirements; and

WHEREAS, the Supplement includes commitments for control measures that do not have quantified emission reductions but provide a strengthening of the SIP, such as measures for further study that do not contribute to the attainment demonstration and a measure designed to ensure emission reductions assumed to occur will in fact occur; and

WHEREAS, the SCAQMD staff concludes that the project is exempt from CEQA because the Supplement is not proposing to add new or delete any control measures that have the potential to have a direct or indirect adverse impact on the environment but merely presents updated analyses and other changes that do not have the potential to cause a direct or indirect adverse impact on the environment; and

WHEREAS, the SCAQMD Governing Board has determined that no socioeconomic impact will result from the Supplement; and

WHEREAS, public hearings in each affected county have been properly noticed by providing a 45-day notice in the newspapers in accordance with Health & Safety Code § 40466; and

WHEREAS, the SCAQMD Governing Board has held a final public hearing to consider approval of the Supplement in accordance with all provisions of law; and

WHEREAS, the SCAQMD specifies the manager of the Supplement as the custodian of the documents or other materials which constitute the record of proceedings upon which the approval is based, which are located at the South Coast Air Quality Management District, 21865 Copley Drive, Diamond Bar, California.

NOW, THEREFORE, BE IT RESOLVED, that the SCAQMD Governing Board does hereby determine that the Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin, Attachment B to the Board Letter, is exempt from the requirements of CEQA.

BE IT FURTHER RESOLVED, that the SCAQMD Governing Board does hereby approve, pursuant to the authority granted by law, the Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin, Attachment B to the Board Letter, and incorporated herein by this reference.

BE IT FURTHER RESOLVED, that the SCAQMD staff is hereby directed to take action in accordance with the updated 2012 SIP emission reduction commitments

to attain the 24-hour PM2.5 NAAQS listed in Table F-1 of Attachment F to the Supplement, and incorporated herein by this reference.

BE IT FURTHER RESOLVED, that the SCAQMD Executive Officer is hereby directed to forward a copy of this Resolution and Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin to CARB, and to request that these documents be forwarded to the U.S. EPA for approval as part of the California SIP. In addition, the SCAQMD Executive Officer is directed to forward any other information requested by the U.S. EPA for informational purposes.

Attachment

DATE: _____ _____

CLERK OF THE BOARD

ATTACHMENT B

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Draft Supplement to the 24-Hour PM2.5 State Implementation Plan for the South Coast Air Basin

January 2015

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Barry R. Wallerstein, D. Env.

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PREFACE

A version of this Draft Supplement was made available at the SCAQMD Public Information Center on December 19, 2014 in accordance with the release of the noticing for the public hearings in February 2015 pursuant to the requirements of the Health & Safety Code § 40466. In response to comments and suggestions from the staff at U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB), some additions and clarifications have been included in this January 2015 version of the Draft Supplement to be considered by the SCAQMD Governing Board for approval and submission into the 24-hour PM2.5 State Implementation Plan (SIP) for the South Coast Air Basin at their February 6, 2015 Board Meeting.

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ATTACHMENT F – Updated List of Control Strategy Commitments

INTRODUCTION

The Federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (U.S. EPA) to develop and enforce regulations to protect the public from airborne contaminants known to be hazardous to human health. To do so, the U.S. EPA sets National Ambient Air Quality Standards (NAAQS) for "criteria" pollutants, such as particulate matter less than 2.5 microns (PM2.5), and designates areas in attainment or in non-attainment of the NAAQS. According to the CAA, if an area is designated non-attainment, the state is required to submit a State Implementation Plan (SIP) to demonstrate how and when the NAAQS will be achieved, maintained and enforced. The federal SIP requirements for the South Coast Air Basin (Basin) non-attainment area are addressed through Air Quality Management Plans (AQMP) prepared by the South Coast Air Quality Management District (SCAQMD) in collaboration with the California Air Resources Board (CARB) and the South California Association of Governments (SCAG). Required elements of the SIP include:

- Emission Inventory *(CAA §172(c)(3))*
- Attainment demonstration and modeling *(CAA §172(a)(2)(A)*)
- All Reasonably Available Control Measures (RACM) including adoption of Reasonably Available Control Technology (RACT) *(CAA § 172(c)(1)*)
- Demonstration of Reasonable Further Progress *(CAA §172(c)(2)*)
- New Source Review Program*(CAA §172(c)(4) and (5)*)
- Contingency measures *(CAA §172(c)(9)*)
- Transportation Control Measures *(CAA §108)(e)*

On December17, 2006, the U.S. EPA lowered the 24-hour PM2.5 NAAQS from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ and the South Coast Air Basin was subsequently designated non-attainment for 2006 24-hour PM2.5 NAAQS on December 14, 2009. U.S. EPA requires the SIP to be submitted no later than three years after the designation. To assist in the development of the SIPs to demonstrate attainment of the 2006 24-hour PM2.5 NAAQS, the U.S. EPA issued implementation guidance in March of 2012.

The 2012 AQMP was approved by the SCAQMD Governing Board in December 2012, with additional amendments approved in February 2013, and was subsequently submitted to CARB and the U.S. EPA for inclusion into the SIP. That plan demonstrated projected attainment of the 2006 24-hour PM2.5 NAAQS by 2014. However, a recent court decision (*Nat'l Res. Def. Council v. EPA*, 706 F.3d 428 (D.C. Cir. 2013)) compels U.S. EPA to evaluate the 24-hour PM2.5 SIP under CAA Subpart 4 requirements specific to particulate matter, in addition to the general planning provisions of Subpart 1 that were previously used for PM2.5 SIPs. Subpart 4 provides for an attainment year of 2015 for "moderate" areas, one year later than the attainment year in the 2012 AQMP. Furthermore, preliminary ambient air quality data suggests that

meeting the 2006 24-hour PM2.5 NAAQS by the end of 2014 is not likely, largely due to unusually extreme drought conditions in the Basin. Therefore, the purpose of this Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin is to demonstrate attainment of the 2006 24-hour PM2.5 NAAQS by 2015 as allowed under CAA Subpart 4. In addition, the Supplement will update the transportation conformity budgets, RACM/RACT analysis, emission reduction commitments submitted in the 2012 AQMP, and other Subpart 4 requirements.

2012 AIR QUALITY MANAGEMENT PLAN

The 2012 AQMP demonstrated attainment of the 2006 24-hour PM2.5 NAAQS (35 $\mu g/m^3$) with successful implementation of all feasible controls and assuming typical weather, demonstrated the earliest possible attainment date for the Basin was the end of 2014.

The 2012 AQMP included the items listed above but, more specifically, the following elements:

- Attainment demonstration of the 2006 24-hour PM2.5 NAAQS for 2014;
- A RACM/RACT analysis;
- 2014 transportation conformity budgets; and
- Control strategy including emission reduction commitments with adoption and implementation dates

Since the Governing Board approval of the 2012 AQMP in December 2012 with amendments in February 2013, two PM2.5 control measures, BCM-01 (Further Reductions from Residential Wood Burning Devices) and BCM-02 (Further Reductions from Open Burning), were adopted in the form of amendments to Rules 445 (Wood Burning Devices) and 444 (Open Burning), respectively. Together, these amendments generated a total of 11.7 tons of PM2.5 per day reductions on an episodic basis. The attainment demonstration relies primarily on emissions reductions associated with revisions to Rules 444 and 445. Both of these rule revisions have been adopted by SCAQMD and approved by U.S. EPA. (78 FR 59249, September 26, 2013).

The only other emission reduction commitment in the 2012 PM2.5 SIP was control measure CMB-01 (Further NOx Reductions from RECLAIM) which was submitted as a contingency measure only. This control measure is anticipated to be considered by the SCAQMD Governing Board in the first half of 2015. By implementing these control measures, the air quality modeling in the 2012 AQMP demonstrated attainment of the 2006 PM2.5 standard in 2014. However, as discussed later, unanticipated extreme weather conditions have affected air quality making attainment in 2014 unlikely.

U.S. EPA IMPLEMENTATION GUIDANCE FOR THE 2006 24-HOUR PM2.5 NAAQS

In March of 2012, U.S. EPA issued a memorandum to provide guidance regarding the development of SIPs required to demonstrate attainment of the 2006 24-hour PM2.5 NAAQS. The guidance included a section regarding "overall framework" based on CAA Subpart 1 for general nonattainment plan provisions, specifically section 172(a)(2)(A) that requires plans to demonstrate attainment "as expeditiously as practicable but no later than five years from the date such area was designated nonattainment.

The U.S. EPA's previous PM2.5 Implementation Rules and Guidance were challenged, partly because they were based on general implementation provisions under Subpart 1 of the CAA rather than the ~~particulate matter~~PM10 specific provision of Subpart 4 of the CAA. In January 2013, the U.S. Court of Appeals (*Nat'l Res. Def. Council v. EPA*, 706 F.3d 428 (D.C. Cir. 2013)) decided that the U.S. EPA misinterpreted the CAA relative to the statutory requirements for the 1997 PM2.5 standards, erred in applying the provisions of Subpart 1 rather than Subpart 4, and needs to re-promulgate the PM2.5 implementation rules with Subpart 4. On June 6, 2013, U.S. EPA withdrew the March 2012 Implementation Guidance for 2006 24-hour PM2.5 NAAQS.

CLEAN AIR ACT, TITLE 1, PART D, SUBPART 4

Title 1, Part D of the CAA outlines the plan requirements for nonattainment areas and is divided into six subparts. Subpart 1 provides general provisions for nonattainment areas; Subpart 2 through 4 include, respectively, additional provisions for ozone, carbon monoxide and particulate matter nonattainment areas. Subpart 5 consists of additional provisions for areas designated nonattainment for sulfur oxide, nitrogen dioxide or lead. Finally, Subpart 6 lists a general savings clause.

Provisions in Subpart 4 are based on the classification of the nonattainment region as moderate or serious. The South Coast Air Basin ~~is considered~~has been classified by U.S. EPA as moderate nonattainment for the 2006 24-hour PM2.5 NAAQS. For a moderate area, "the attainment date shall be, as expeditiously as practicable, but no later than the end of the sixth calendar year after the areas designation as nonattainment." (*CAA, Title 1, Part D, Subpart 4, Section 188(c)(1)*) As discussed earlier, the South Coast Air Basin designation as non-attainment for the 2006 24-hour PM2.5 NAAQS (35 µg/m^3) was effective December 14, 2009, thus providing for a latest attainment date of December 31, 2015. Subpart 4 provisions also allow~~s~~ for no more than 2 one-year extensions of the attainment date for a "moderate" area as long as all SIP commitments are met and if the previous single year's air quality shows attainment (*Section 188 (d)*). Finally, Subpart 4 Section 189(e) necessitates that control requirements applicable for major PM2.5

sources shall also apply to major sources of PM2.5 precursors unless U.S. EPA finds that major sources do not significantly contribute to nonattainment. PM2.5 has four major precursors, other than direct PM2.5 emissions, that contribute to the development of the ambient PM2.5: ammonia, nitrogen oxide (NOx), sulfur oxides (SOx), and volatile organic compounds (VOC).

AIR QUALITY MONITORING DATA

Preliminary air quality monitoring data indicates that attainment of the 2006 24-hour PM2.5 NAAQS (35 µg/m^3) is not likely to be achieved by the end of 2014. It should be noted that U.S. EPA has proposed to find that the former 24-hour PM2.5 NAAQS (65 µg/m^3) has been attained, along with the previous annual PM2.5 NAAQS of 15 µg/m^3 (79, FR, 72999, Dec 9, 2014). Attainment of the 2012 annual PM2.5 NAAQS of 12 µg/m^3 will be addressed in the upcoming 2016 AQMP.

With regard to the air quality monitoring, only the Mira Loma location in Western Riverside County exceeds the 2006 24-hour PM2.5 NAAQS. Attainment of the PM2.5 standard is based on a "design value" equal to the 3-year average of the annual 98th percentile concentration with prescribed rounding conventions. In the case of the 2006 24-hour PM2.5 NAAQS, attainment is achieved if this design value is less than 35.4 µg/m^3. Preliminary data through June 2014 shows a 98th percentile PM2.5 concentration in 2014 is 35 µg/m^3. However, including the 98th percentiles of the preceding two years as shown below, the design value at Mira Loma will likely exceed the standard. Note that the data for 2014 is preliminary, and that it does not include the November and December months of 2014 when exceedances have historically been observed.

2012: 35.8 µg/m^3

2013: 37.5 µg/m^3

2014: 35.0+ µg/m^3

3-Year Average: > 36 µg/m^3

Thus, according to this data, attainment of the 2006 24-hour PM2.5 NAAQS (35 µg/m^3) will not be achieved by the end of 2014 as anticipated in the 2012 AQMP. As discussed below, the higher levels in 2013 and possibly 2014, which reverse a long term trend of improving PM2.5 concentrations, were affected by extreme drought conditions in Southern California.

SUPPLEMENT TO THE 24-HOUR PM2.5 SIP

In close consultation with U.S. EPA and CARB, the SCAQMD is proposing to supplement the previous 24-hour PM2.5 SIP submittal to address Subpart 4 provisions and requirements with the following elements that are included in this Supplement:

- Demonstration of attainment of the 24-hour PM2.5 NAAQS by 2015;
- Discussion of the effects of the drought on the 2014 attainment date;
- Provide new transportation conformity budgets for 2015;
- Updated RACM/RACT analysis;
- Demonstration of compliance with CAA Subpart 4, Section 189(e) that applies to major source PM2.5 precursors, such as VOC and ammonia unless U.S. EPA finds these sources do not significantly contribute to nonattainment; and
- Updated list of control strategy commitments.

Upon adoption by the SCAQMD Governing Board, the Supplement will be submitted to CARB and subsequently to the U.S. EPA for inclusion into the SIP.

2015 ATTAINMENT DEMONSTRATION

The 2012 AQMP provided attainment projections for years 2014 and 2019 with the implementation of all feasible control measures. To show attainment of the 2006 24-hour PM2.5 NAAQS by 2015 as allowed under Subpart 4, the 2012 AQMP inventories and modeling results will be used in an interpolation analysis between the 2014 and 2019 projections. This demonstration can be found in Attachment A that also includes a discussion based on the emissions inventory and inter-pollutant weighting factors.

EFFECTS OF THE DROUGHT

Attachment B includes a weight-of-evidence discussion on the lack of rainfall and drought conditions in the South Coast Air Basin for the past two years, and how that has impacted the PM2.5 ambient levels. Limited rain means there is less crusting and wetting of soil and road surfaces. Thus, more road dust and fugitive dust emissions are generated. A reduced frequency of storms translates to fewer days of enhanced pollution dispersion. Without such dispersion, there is no deep mixing of the atmosphere, particulate matter captured by raindrops or wind to transport the pollution away from the region. Finally, Attachment B will include a discussion of the impact of a continued drought on the 2015 attainment demonstration. Given the weather conditions and ambient data in 2013 and 2014, the earliest practicable attainment date for the 24-hour PM2.5 NAAQS is 2015.

PATHS FORWARD

Despite the attainment demonstration mentioned above, there remains considerable uncertainty in the PM2.5 monitoring results for 2014 and the meteorological conditions and frequency of rainfall that will occur in 2015. In order to demonstrate attainment the 98th percentile of the 2015 24-hr PM2.5 readings at Mira Loma has to be significantly below the standard of 35.4 ug/m3 to compensate for high exceedances caused by the drought in 2013 and 2014, achieving a 3-year average design value at or below the standard. Although additional emissions reductions are expected in 2015, attainment of the standard, given the variability of weather conditions, remains far from certain. Acknowledging this uncertainty, there are several potential outcomes and pathways for the Basin's attainment status under the Clean Air Act depending on the actual certified air quality monitoring results for 2014 and 2015.

- 24-hour PM2.5 data at Mira Loma for 2014 and 2015 is clean enough to attain the standard based on a three-year (2013-2015) average design value. The Basin could then be re-designated as attainment for this PM2.5 standard

- The three-year average design value at Mira Loma does not show attainment in 2015, but the 98th percentile of the 24-hour PM2.5 data at Mira Loma for the single year 2015 is below 35.4 μg/m^3. Under CAA Subpart 4 provisions, if this air quality condition is met, and all PM2.5 SIP commitments have been satisfied, then the Basin is eligible for a one-year attainment date extension to 2016. A second one-year extension to 2017, if the same conditions are met in 2016, is also possible.

- The three-year average design value at Mira Loma does not show attainment in 2015 and the 98th percentile of the 24-hour PM2.5 data at Mira Loma for the single year 2015 is above 35.4 μg/m^3. Under Subpart 4 of the CAA, upon U.S. EPA's determination that the Basin failed to attain the standard by the attainment date, the Basin would be automatically reclassified from a "moderate" nonattainment area to a "serious" non-attainment area. The new attainment deadline would be 2019, and more stringent "serious" area requirements would apply, including requirements to implement Best Available Control Measures (BACM) and a lower major source threshold (70 tons per year vs. the current 100 tons per year). A full analysis for implementation of these requirements and other control measures to ensure attainment as expeditiously as practicable would be included in the 2016 AQMP, which is also addressing the annual 2012 PM2.5 standard.

2015 TRANSPORTATION CONFORMITY BUDGETS

Attachment C includes new transportation conformity budgets based on the interpolated 2015 vehicle miles traveled (VMT) used for the attainment demonstration.

RACM/RACT ANALYSIS

A RACM demonstration, including a RACT analysis, was submitted to U.S. EPA as component of 2012 AQMP. Updates to the RACM/RACT analysis, which addresses direct PM2.5 and precursor emissions, can be found in Attachment D.

~~DEMONSTRATION OF COMPLIANCE WITH~~ CAA SUBPART 4, SECTION 189(e) AND OTHER PRECURSOR REQUIREMENTS

CAA Subpart 4, Section 189(e) addresses control requirements for major stationary sources of PM2.5 precursors, such as VOC and ammonia. The sections states, "the control requirements applicable under plans in effect under this part for major stationary sources of PM–10 shall also apply to major stationary sources of PM–10 precursors, except where the Administrator determines that such sources do not contribute significantly to PM–10 levels which exceed the standard in the area." SCAQMD staff's analysis (*see Attachment E*) shows that VOC and ammonia from major sources (100 tons per year or greater) do "not contribute significantly" to overall emissions and thus ambient PM2.5 levels. Furthermore, both VOC and ammonia are subject to requirements for Best Available Control Technology (BACT) under existing New Source Review at a zero threshold, so those emission will still be minimized. VOC emissions are also required to be offset when a new or modified source will emit four tons per year or more of VOC, well below the level at which the PM2.5 requirement would require offsets. So, the only practical difference between the existing control program for New Source Review and a program that expressly applies to VOC and ammonia as PM2.5 precursors is that any new or modified source of 100 tons per year or more of ammonia will not need offsets. As explained Attachment E, it is extremely unlikely that there would be a new stationary source of 100 tons per year of ammonia anywhere in the Basin. Moreover, the SCAQMD has adopted numerous rules limiting VOCs, continually seeking all feasible reductions, as part of the stringent ozone control program. Thus, the SCAQMD believes the requirements of CAA Subpart 4, Section 189(e) and other precursor requirements are satisfied and thus request that the Administrator of U.S. EPA makes this determination.

CONTROL STRATEGY COMMITMENTS

Attachment F provides an updated list of control strategy commitments originally proposed in the 2012 AQMP in Chapter 4 (Control Strategy and Implementation).

ATTACHMENT A

ATTAINMENT DEMONSTRATION OF THE 24–HOUR PM2.5 NATIONAL AMBIENT AIR QUALITY STANDARD FOR 2015

BACKGROUND

The 2012 AQMP provided a comprehensive attainment demonstration for the 2006 24-hour PM2.5 NAAQS (35 μg/m^3) in 2014 for the South Coast Air Basin (Basin). The analysis which is presented in Chapter 5 of the AQMP main document and Appendix V provides a detailed discussion of the modeling analysis including modeling platforms (both meteorological and dispersion), chemical modules, model parameterization, emissions, background concentrations, base year performance and future year baseline and controlled PM2.5 projections. The attainment demonstration was anchored using the 2008 base year AQMP inventory and future year projections based on regional growth factors provided by the Southern California Association of Governments. The analysis followed U.S. EPA modeling guidance in simulating the speciated 98th percentile 24-hour PM2.5 levels for the 2014 baseline and controlled emissions scenarios as well as the 2019, 2023 and 2030 controlled scenarios. The NWS WRF meteorological model and the CMAQ dispersion model coupled with SAPRC99 chemistry were the primary modeling tools employed in the analyses. Boundary conditions were developed from GEOS-Chem global simulation model output. Simulations were conducted for gridded domain encompassing the majority of Southern California, northern Baja Mexico and the eastern Pacific Ocean.

The analysis demonstrated attainment of the 24-hour standard in 2014 for the controlled emissions based on the application of simulation determined, particulate species specific, relative reduction factors (RRF) applied to a 5-year weighted speciated 2008 design value. The demonstration showed attainment in 2014 at the Mira Loma Basin design site for the controlled emissions with a predicted design concentration of 34.3 μg/m^3. Subsequent simulations for controlled emissions indicated that the standard would be met with a 2019 design value of 35.4 μg/m^3 decreasing to 33.7 μg/m^3 in 2023 and 33.4 μg/m^3 by 2030. (The threshold design value for demonstrating attainment to the standard for model simulations is set at 35.4 μg/m^3 based on established rounding conventions). The demonstration provided future year controlled emissions projections of 24-hr PM2.5 design values for six additional monitoring locations including Rubidoux, the former Basin design site, Fontana – an area heavily impacted by local industry including warehouse distribution centers, Central Los Angeles, South Long Beach and North Long Beach – areas impacted by goods movement related emissions sources, and Anaheim representing urban residential impacts. Finally the demonstration also included an unmonitored area analysis to confirm that all PM2.5 impact areas were being fully assessed in the analysis.

DROUGHT IMPACT ON AIR QUALITY

The west coast of the U.S. has experienced a severe drought for the past several years with 2013 annual rainfall total measured at Downtown Los Angeles of 3.6 inches, far below the 14.9 inch long term average. Rainfall events of 0.01 inches of rain or more were 25 percent lower than the average of 28 days typically occurring during the 1st and 4th quarters of the year. Under the

drought conditions, Mira Loma 24-hr PM2.5 98th percentile concentrations experienced a reversal in the long-term trend of declining concentrations rising from a 2012 value of 35.1 µg/m^3 to 37.5 µg/m^3 in 2013. Based on a conservative analysis of the impact of rain fall events on the 98th percentile concentration, the drought accounted for roughly 1.6 µg/m^3 additional mass to the observed 98th percentile concentration. (A discussion of the rain event-concentration impact is provided in Attachment B). It is anticipated that the 2014 Basin 24-hr PM2.5 design value (measured at Mira Loma) based on the 2012-2014 3-year average of the 98th percentile concentration will exceed 35.4 µg/m^3 due to the observed continuation of the drought.

ANALYSIS UPDATE

An update of the 2012 24-hour PM2.5 attainment demonstration has been conducted to show attainment of the NAAQS for the year 2015, based on a 2015 controlled emissions inventory. The analysis uses the 2014 and 2019 projected design values using the controlled emissions to calculate the 2015 expected design. The 2015 design value was calculated using linear interpolation by component species between the two milestone years. In addition, the analysis includes an update to the unmonitored area attainment demonstration.

To corroborate the interpolation based attainment demonstration, an analysis is provided to assess the impact to the 2014 design value resulting from changes in the projected controlled emissions inventory from 2014 to 2015 using emissions (tons per day) to species projected PM2.5 concentrations ratios.

2015 24-HR PM2.5 ATTAINMENT DEMONSTRATION

Table A-1 summarizes the site specific 2015 24-Hr PM2.5 attainment demonstration. The maximum concentration for the Basin is projected to continue to occur at the Mira Loma monitoring site with an expected design value of 34.5 µg/m^3. Figure A-1 illustrates the 2015 predicted design values by component species. The largest contribution to the 2015 design value is nitrate followed by organic carbon. Table A-2 provides the corresponding 2014 and 2019 projected design values for the seven stations analyzed in the interpolation analysis.

Appendix V of the 2012 AQMP provided a comprehensive unmonitored area analysis that demonstrates that all grid cells covered by the regional modeling simulation were predicted to have 2014 design concentrations meeting the 24-Hr PM2.5 35 µg/m^3 standard. The projected average change in design concentration between 2014 and 2015 is estimated to be a 0.2 µg/m^3 increase in PM2.5 but this will not result in a change in the attainment demonstration in 2015. A corresponding 0.2 µg/m^3 increase was added to the concentration in cell (89,58), the cell with the peak unmonitored area design concentration. The resulting design concentration of 31.4 µg/m^3 for 2015 meets the unmonitored area attainment test. TableA-3 summarizes the projected change in predicted particulate component species for the seven sites.

TABLE A-1

2015 24-Hr PM2.5 Attainment Demonstration

Station	Predicted Mass ($\mu g/m^3$)
Anaheim	27.0
S. Long Beach	25.0
Fontana	33.1
N. Long Beach	28.7
Los Angeles	31.8
Mira Loma	34.5
Rubidoux	32.5

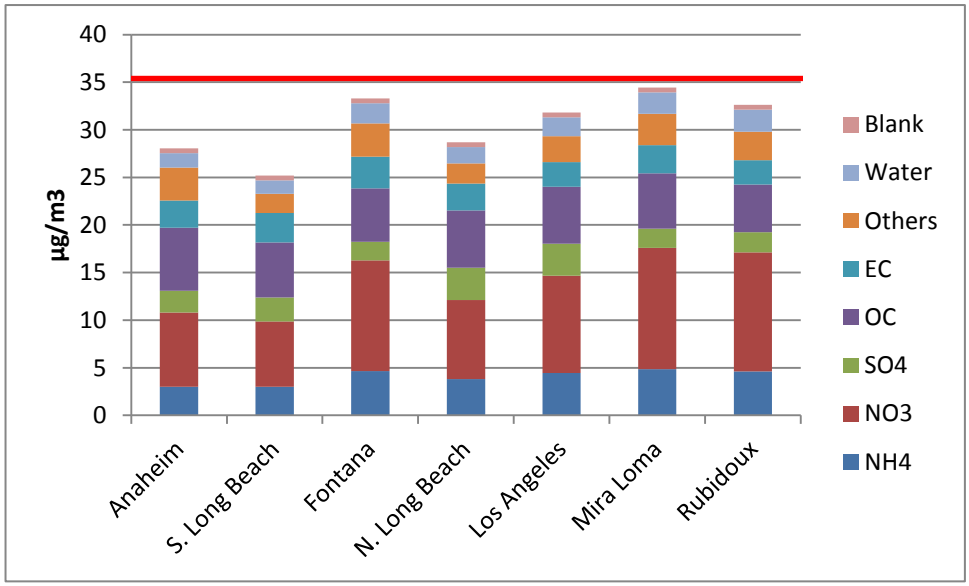


FIGURE A-1

2015 24-Hr PM2.5 Predicted Component Species Design Concentrations
(The red band at 3g micrograms per cubic meter depicts the Federal Standard)

KEY:

EC = elemental carbon
OC = organic carbon
SO4 = sulfate
NO3 = nitrate
NH4= ammonium
Others = crustal metals

TABLE A-2

Component Interpolated 24-Hour Average PM2.5 2015 Attainment Demonstration

YEAR	NH4	NO3	SO4	OC	EC	Others	Water	Blank	Mass
Anaheim									
2014	2.9	7.5	2.2	6.6	2.8	3.5	1.5	0.5	27.5
2015	**3.02**	**7.78**	**2.28**	**6.62**	**2.86**	**3.46**	**1.54**	**0.5**	**28.0**
2019	3.5	8.9	2.6	6.7	3.1	3.3	1.7	0.5	30.2
S. Long Beach									
2014	3	6.9	2.5	5.6	3.1	2	1.4	0.5	24.8
2015	**3**	**6.88**	**2.52**	**5.76**	**3.1**	**2.02**	**1.42**	**0.5**	**25.0**
2019	3	6.8	2.6	6.4	3.1	2.1	1.5	0.5	25.9
Fontana									
2014	4.7	11.8	1.9	5.3	3.3	3.5	2.1	0.5	32.9
2015	**4.64**	**11.66**	**1.92**	**5.64**	**3.32**	**3.5**	**2.1**	**0.5**	**33.1**
2019	4.4	11.1	2	7	3.4	3.5	2.1	0.5	33.9
N. Long Beach									
2014	3.8	8.2	3.4	5.8	2.8	2.1	1.7	0.5	28.3
2015	**3.82**	**8.28**	**3.4**	**6.04**	**2.82**	**2.12**	**1.72**	**0.5**	**28.7**
2019	3.9	8.6	3.4	7	2.9	2.2	1.8	0.5	30.3
Los Angeles									
2014	4.6	10.5	3.3	5.6	2.7	2.6	2	0.5	31.8
2015	**4.46**	**10.2**	**3.36**	**5.98**	**2.62**	**2.72**	**1.98**	**0.5**	**31.8**
2019	3.9	9	3.6	7.5	2.3	3.2	1.9	0.5	31.9
Mira Loma									
2014	4.9	12.8	2	5.6	2.9	3.2	2.3	0.5	34.3
2015	**4.86**	**12.72**	**2.02**	**5.84**	**2.96**	**3.28**	**2.26**	**0.5**	**34.5**
2019	4.7	12.4	2.1	6.8	3.2	3.6	2.1	0.5	35.4
Rubidoux									
2014	4.7	13	2	4.7	2.5	2.8	2.4	0.5	32.5
2015	**4.62**	**12.52**	**2.1**	**5.02**	**2.56**	**2.98**	**2.32**	**0.5**	**32.5**
2019	4.3	10.6	2.5	6.3	2.8	3.7	2	0.5	32.5

TABLE A-3

Average Interpolated Change in Component Species Concentrations from 2014 to 2015 (µg/m^3)

Station	NH4	NO3	SO4	OC	EC	Others	Water	Blank	Mass
Anaheim	0.1	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.5
S. Long Beach	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2
Fontana	-0.1	-0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.2
N. Long Beach	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.4
Los Angeles	-0.1	-0.3	0.1	0.4	-0.1	0.1	0.0	0.0	0.0
Mira Loma	0.0	-0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.2
Rubidoux	-0.1	-0.5	0.1	0.3	0.1	0.2	-0.1	0.0	0.0
Average	**0.0**	**-0.1**	**0.0**	**0.2**	**0.0**	**0.1**	**0.0**	**0.0**	**0.2**

EMISSIONS INVENTORY APPROACH

Table A-4 presents the 2015 interpolated Basin total emissions inventory and the change from the 2014 projection. Both VOC and NOX emissions are projected to be lower by 7.9 and 17.8 TPD respectively in 2015. Little change was projected in SOx emissions and directly emitted particulate emissions are estimated to grow at a nominal rate of 0.1 tons per day. The 2012 AQMP provided a set of estimated emissions (TPD) to particulate formation potential (µg/m^3) ratios for VOC, NOx, SOx, and PM2.5 to secondary organic carbon, nitrate, sulfate and the combination of primary organic compound, elemental carbon and others. The ratios can provide an estimate of the relative contribution of emissions to particulate formation and be used to roughly estimate the magnitude of change in particulate expected from changes in the emissions inventory. Please note that the ratios were calculated specifically for a 2014 inventory; they are used here to estimate the magnitude of the expected net change in the 2015 PM2.5 particulate concentrations from 2014. These estimates are compared to the average change in component species concentrations (listed in Table A-2) where nitrates and sulfates are calculated to incorporate ammonium and bonded water.

As shown in Table A-4, the projected change in baseline emissions from 2014 to 2015 is estimated to result in 0.3 µg/m^3 reduction in regional nitrate and a small increase in primary PM2.5. The average projected changes in the 2015 attainment demonstration from the interpolation analysis show a comparable reduction in nitrate, a nominal increase (0.1 µg/m^3) in sulfate and a larger 0.2 µg/m^3 increase in primary PM2.5. While the estimates do not exactly match, the magnitude of the change and the direction (increase or decrease) for the key components is aligned. This indicates that the interpolated PM2.5 attainment demonstration is consistent with the projected change in emissions.

TABLE A-4

Average Interpolated Change in Component Species Concentrations from 2014 to 2015 (µg/m^3)

	VOC (TPD)	NOX (TPD)	SOX (TPD)	PM2.5 (TPD)
2014 Controlled Emissions	451.1	506.0	18.4	69.9
2015 Interpolated Controlled Emissions	443.2	488.2	18.4	70.0
TPD Change: 2014-2015	**-7.9**	**-17.8**	**0**	**+0.1**
	SECONDARY ORGANIC CARBON	**NITRATE**	**SULFATE**	**PRIMARY ORGANIC CARBON + ELEMENTAL CARBON + OTHERS**
Per Ton Conversion Factors: PM2.5 (µg/m3) /TPD	0.004	0.014	0.111	0.2132
2014-2015 Emissions Inventory Projected Change in PM2.5 (µg/m3)	0.0	-0.3	0	0.02
Average Simulated Change in PM2.5 Concentration (µg/m3) 2014-2105	0.0	-0.1	0.1	0.2

SUMMARY

The revised analysis demonstrates attainment of the 24-hour PM2.5 standard in the Basin, including unmonitored areas, by 2015 using interpolation techniques supported by projected emissions. However, there remains considerable uncertainty in the meteorological conditions and frequency of rainfall that will occur in 2015. In order to demonstrate attainment the 98th percentile of the 2015 24-hr PM2.5 readings at Mira Loma has to be significantly below the standard of 35.4 ug/m3 to compensate for high exceedances caused by the drought in 2013 and 2014, achieving a 3-year average design value at or below the standard. Although additional emissions reductions are expected in 2015, attainment of the standard, given the variability of weather conditions, remains far from certain.

~~The revised analysis shows that the Basin will be in attainment of the 24-hour PM2.5 standard in 2015 with a maximum concentration of 34.5 µg/m^3. The analysis confirms that the unmonitored area analysis will also demonstrate attainment in 2015. The projected 2015 change in emissions accounts for a nominal decrease in ammonium nitrate and a limited increase in the particulate component concentrations. While the absolute concentration change is lower than the~~

~~interpolation modeled concentration, the directional response is consistent with nitrates being lower and particulates nominally increasing.~~

REFERENCES

1. South Coast Air Quality Management District, Final 2012 Air Quality Management Plan, Diamond Bar, CA., February 2013.

2. South Coast Air Quality Management District, Final 2012 Air Quality Management Plan, Appendix V, Modeling Attainment Demonstrations, Diamond Bar, CA., February 2013.

ATTACHMENT B

EFFECTS OF THE DROUGHT

BACKGROUND

The 2014 attainment demonstration was based on simulated RRFs applied to a weighted 2008 design value. The 5-year weighted PM2.5 design value incorporated 98th percentile concentrations from 2006 through 2010. The five year period used for the design calculation covered a meteorological period, when assessed for the frequency of rainfall events and precipitation accumulations, was essentially average compared to the long term (50+ year) statistics. As a consequence, the 2014 projected 24-hour PM2.5 design value for Mira Loma assumed a similar window of average precipitation events and rainfall totals with the concurrent natural pollution dispersion potential associated with the unstable weather.

Unfortunately, the west coast of the U.S. has experienced a severe drought for the past several years with 2013 annual rainfall total measured at Downtown Los Angeles of 3.6 inches, far below the 14.9 inch long term average. Rainfall events of 0.01 inches of rain or more were 25 percent lower than the average of 28 days typically occurring during the 1st and 4th quarters of the year. Under the drought conditions, Mira Loma 24-hr PM2.5 98th percentile concentrations experienced a reversal in the long-term trend of declining concentrations rising from a 2012 value of 35.1 µg/m^3 to 37.5 µg/m^3 in 2013. Based on a conservative analysis of the impact of rain fall events on the 98th percentile concentration, the drought accounted for roughly 1.6 µg/m^3 to the observed 98th percentile concentration. (A discussion of the rain event-concentration impact is provided in the weight of evidence discussion).

Through October, the drought has continued and only 8 rain days have been observed at Downtown Los Angeles in 2014. More specifically, no rain fell in January with only two days of minor precipitation in February before the 26th. Note that historically the majority of exceedances of the standard occur between November and February. Concurrently, the preliminary un-validated observed 98th percentile concentration at Mira Loma was measured at 35 µg/m^3 through June. Given that the 4th quarter has the potential for higher PM2.5 concentrations, it is anticipated that the 2014 Basin 24-hr PM2.5 design value (measured at Mira Loma) based on the 2012-2014 3-year average of the 98th percentile concentration will exceed 35.4 µg/m^3.

The focus of this discussion is to address the impact of the drought on the 24-hour PM2.5 attainment by first developing a methodology to correct for variations in rainfall frequency then applying that methodology to the trend of ambient PM2.5 to determine the likelihood for future compliance.

ACCOUNTING FOR SEASONAL VARIATIONS IN RAINFALL FREQUENCY

As described above, the West Coast of the U.S. has been impacted by a multiple year drought that has reduced the frequency of rain events and increased the likelihood for atmospheric stagnation. A question has arisen as to what would be the impact to the 2015 attainment demonstration if the drought continues beyond 2014. To assess this potential situation, an algorithm was generated to adjust the predicted annual PM2.5 98th percentile concentration based on the deviation from the average expected rain frequency. The form of the adjustment was based on the rainfall correction applied to fugitive dust in U.S. EPA AP-42 and is presented through the following equation:

$$\text{Rain Frequency Factor (RFF)} = 1 + \left[\frac{(\text{Q-1 Exp} + \text{Q-4 Exp}) - (\text{Q-1 Obs} + \text{Q-4 Obs})}{182 - (\text{Q-1 Obs} + \text{Q-4 Obs})} \right]$$

Where:

Q-1 Exp = Number of 1st quarter expected rain events ≥ 0.01 " rainfall

Q-4 Exp = Number of 4th quarter expected rain events ≥ 0.01 " rainfall

Q-1 Obs = Number of 1st quarter observed rain events ≥ 0.01 " rainfall

Q-4 Obs = Number of 4th quarter observed rain events ≥ 0.01 " rainfall

The fit of the frequency of rainfall events in the 1st and 4th quarters to the quarterly total rainfall is depicted in Figures B-1a and B-1b. The greater variation in rainfall events occurs in the 1st quarter while the 4th quarter clusters around the number of events below 10. Overall, averages of 28 rain events are expected to occur between the two quarters.

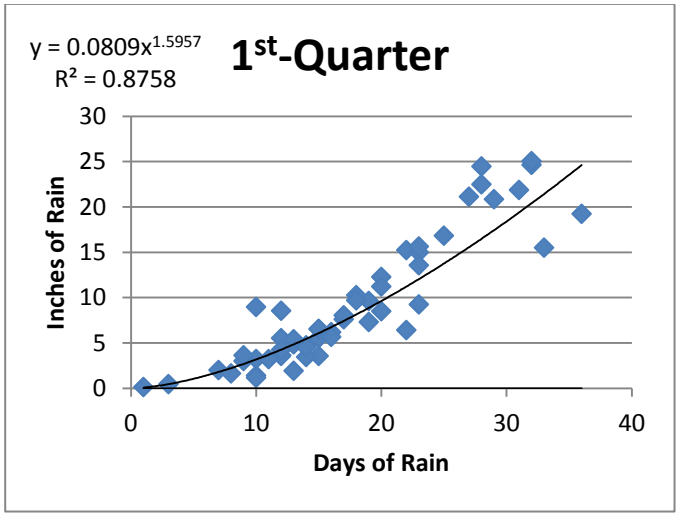


FIGURE B-1a

Power Fit of 1st Quarter Rain Events (1960-2013)

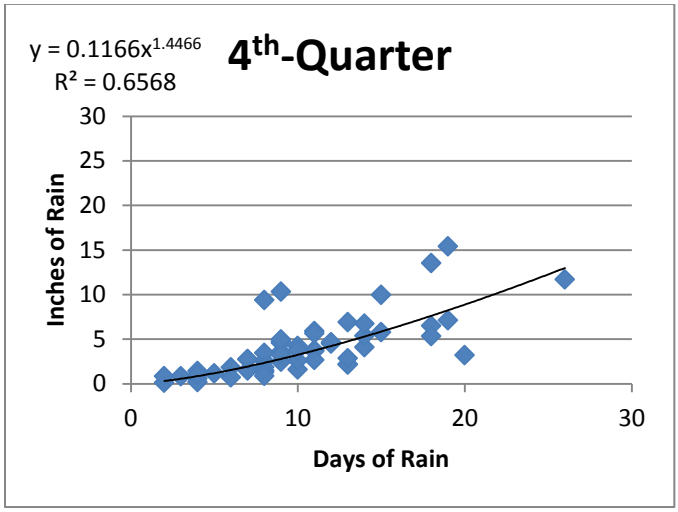


FIGURE B-1b

Power Fit of 4th Quarter Rain Events (1960-2013)

Figure B-2 depicts the trend of the drought adjustment factor calculated as the inverse of the rain frequency factor. The red circle focuses on 2006 - 2010, the period used to develop the 2008 weighted 24-hour PM2.5 design value for Mira Loma used in the attainment demonstration. When the same weighting scheme is applied to the adjustment factors, the average valued 0.999; thereby indicating the 2008 Mira Loma design value was not impacted by either drought or excessively frequent rain events. The adjustment factor was applied to the 2006 through 2013 Mira Loma 24-hour 98th percentile PM2.5 to normalize the annual concentration for year–to-year variations in drought potential. Figure B-3 presents the trend of the rain event normalized 98th percentile concentrations for Mira Loma. The trend was extended to both 2014 and 2015 to provide an estimate of the data for a normal rain event scenario (28 days combined for the 1st and 4th quarters).

Table B-1 provides the observed rain day summary for the Basin as measured at Downtown Los Angeles. Rain day totals for 2014 include the observed total for Q-1 and the long-term average number of days for Q-4. For this analysis, 2015 rain day totals are assumed equal to 2014 rain day totals. The rain frequency factor (RFF) is for each year and the adjustment factor (1/RFF) to estimate rainfall which assumes that the year experiences the long term average numbers of rain days are also provided.

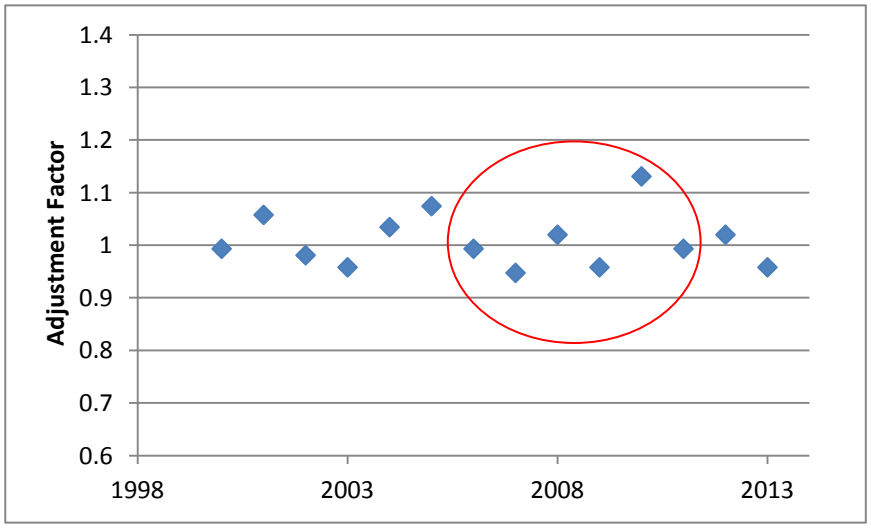


FIGURE B-2

Trend of Annual Drought Adjustment Factor (1/RFF)

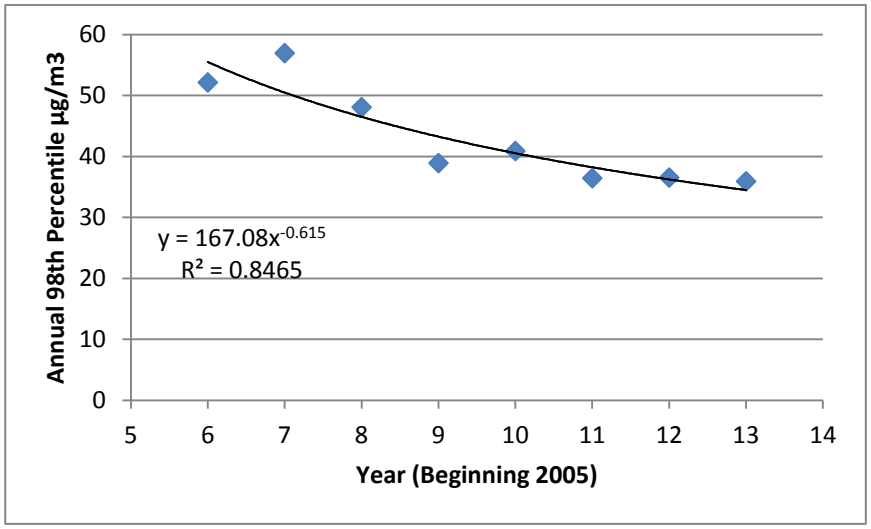


FIGURE B-3

Power Law Fit of Mira Loma PM2.5 Adjusted for Normal Rainfall

TABLE B-1

Trend Estimated Impact of the Drought on Basin 24-Hr PM2.5 Attainment

2006	2007	2008	2009	2010	2011	2012	2013	2014*	2015**
Annual Rainfall									
11.61	5.66	14.43	9.39	23.09	12.26	8.15	3.6	5.16	5.16
Q-1 Rain Days									
19	10	19	12	18	17	11	13	8	8
Q-4 Rain Days									
8	9	12	9	26	10	20	8	10	10
Q-1 & Q-4 Rain Days									
27	19	31	21	44	27	31	21	18	18
Rain Freq Factor (RFF)									
1.006	1.055	0.98	1.043	0.884	1.006	0.98	1.043	1.061	1.061
Adjustment Factor (1/RFF) To Estimate PM2.5 for Average Weather Year Rainfall									
0.994	0.948	1.02	0.958	1.131	0.994	1.02	0.958	0.943	0.943

* 2014 Q-4 rain events assumed average (10)

** 2015 Drought assumed as severe as 2014

ESTIMATING THE IMPACT OF THE DROUGHT ON THE PM2.5 TREND

Table B-2 first presents the 24-hr PM2.5 data for the Mira Loma design site including the observed 98th percentile concentration from 2006 through 2013 and the three year average design value for 2008 through 2013. Table B-2 then outlines the steps to estimate the drought impact to the observed Mira Loma annual 98th percentile concentration and the methodology to estimate the impact to both 2014 and 2015.

Step-1 adjusts the observed 98th percentile Mira Loma data to estimate the trend for average rain events. Step-2 and Step-3 use the power law equation (shown in Figure A-4) to estimate the 98th percentile concentration at Mira Loma for 2006 through 2015 based on the trend and the assumption of average rain event occurrences. The trend projected concentrations for 2014 and 2015 are projected to be 32.97 and 31.60 µg/m^3 for average rain years. Step-5 applies the RFF to the 2014 and 2015 normalized 98th percentile PM2.5 estimated concentrations to address the drought conditions. Step-6 adds the projected 2014 drought impacted 98th percentile concentration to the observed values for 2006 through 2013. Step-7 presents the revised design values which now incorporate the estimated impact of the 2014 drought. As estimated, the 2014 design value is expected to fail to meet attainment reflecting the severity of the 2013 and 2014 drought conditions. Steps-8 and-9 repeat Steps-6 and-7 but with the addition of the 2015 power law estimated 2015 98th percentile to estimate the potential for attainment to the NAAQS if the weather returns to average conditions. In this scenario, the projected 2015 98th percentile concentration and the 2015 design value will meet the NAAQS. Steps-10 and -11 repeat steps-8 and -9 for the 2015 assumption of continued drought. As calculated, the projected 2015 98th percentile concentration and the 2015 design value will still meet the NAAQS under continued drought conditions.

SUMMARY

The preceding analysis projects attainment of the 24-hour PM2.5 standard by 2015, considering the effects of recent drought conditions. However, there remains considerable uncertainty in the PM2.5 monitoring results for 2014 and the meteorological conditions and frequency of rainfall that will occur in 2015. In order to demonstrate attainment the 98th percentile of the 2015 24-hr PM2.5 readings at Mira Loma has to be significantly below the standard of 35.4 ug/m3 to compensate for high exceedances caused by the drought in 2013 and 2014, achieving a 3-year average design value at or below the standard. Although additional emissions reductions are expected in 2015, attainment of the standard, given the variability of weather conditions, remains far from certain.

~~The trend projected 2015 design concentration is expected to demonstrate attainment if normal rainfall occurs in 2015. With an extension of the drought into 2015, the projected 2015 design concentration will still be below 35.4 µg/m^3 and show attainment.~~

TABLE B-2

Trend Estimated Impact of the Drought on Basin 24-Hr PM2.5 Attainment

2006	2007	2008	2009	2010	2011	2012	2013	2014*	2015**
Mira Loma Observed 98th Percentile PM2.5									
52.5	60.1	47.14	40.62	36.17	36.7	35.83	37.5		
Mira Loma PM2.5 Design***									
		53.2	49.3	41.3	37.8	36.2	36.7		
Step-1: Mira Loma Adjusted for Average Weather Year Rainfall									
52.16	56.96	48.1	38.93	40.91	36.46	36.56	35.94		
Step-2: Mira Loma Design Adjusted for Average Weather Year Rainfall									
		52.4	48	42.6	38.8	38	36.3		
Step-3: Power Law Fit of Mira Loma Adjusted for Average Weather Year Rainfall									
55.51	50.49	46.51	43.26	40.54	38.24	36.24	34.5		
Step-4: Mira Loma Trend Projected 2014 & 2015 98th Percentile PM2.5 With Average Rainfall									
								32.97	31.60
Step-5: Mira Loma Trend Projected 2014 & 2015 98th Percentile PM2.5 Adjusted for Drought									
								34.98	33.53
Step-6: Mira Loma 98th Percentile with Trend Projected 2014 98th Percentile PM2.5 Adjusted for Drought									
52.5	60.1	47.14	40.62	36.17	36.7	35.83	37.5	34.98	
Step-7: Mira Loma Design with Trend Projected 2014 98th Percentile PM2.5 Adjusted for Drought									
		53.2	49.3	41.3	37.8	36.2	36.7	36.1	
Step -8: Mira Loma 98th Percentile with Trend Projected 2014 98th Percentile PM2.5 Adjusted for Drought & 2015 Average									
52.5	60.1	47.14	40.62	36.17	36.7	35.83	37.5	34.98	31.60
Step-9: Mira Loma Design with Trend Projected 2014 98th Percentile PM2.5 Adjusted for Drought & Average 2015									
		53.2	49.3	41.3	37.8	36.2	36.7	36.1	34.7
Step-10: Mira Loma 98th Percentile with Trend Projected 2014 & 2015 98th Percentile PM2.5 Adjusted for Drought									
52.5	60.1	47.14	40.62	36.17	36.7	35.83	37.5	34.98	33.53
Step-11: Mira Loma Design with Trend Projected 2014 & 2015 98th Percentile PM2.5 Adjusted for Drought									
		53.2	49.3	41.3	37.8	36.2	36.7	36.1	35.3

* 2014 Q-4 rain events assumed average (10)

** 2015 Drought assumed as severe as 2014

*** Design values are based on 3-year average and 98th percentile concentration. For example, 53.2 µg/m^3 in 2008 is derived from the average of 2006-2008 data (52.5 + 60.1 + 47.14)/3 = 53.2 µg/m^3

REFERENCES

1. South Coast Air Quality Management District, Final 2012 Air Quality Management Plan, Diamond Bar, CA., February 2013.

2. South Coast Air Quality Management District, Final 2012 Air Quality Management Plan, Appendix V, Modeling Attainment Demonstrations, Diamond Bar, CA., February 2013.

3. U.S. EPA, AP-42, Section 13.2.1, Paved Roads, http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf.

ATTACHMENT C

NEW TRANSPORTATION CONFORMITY BUDGETS FOR 2015

BACKGROUND

U.S. EPA's transportation conformity rule, found in 40 CFR parts 51 and 93, details the requirements for establishing motor vehicle emissions budgets in SIPs for the purpose of ensuring the conformity of transportation plans and programs with the SIP attainment demonstration. The on-road motor vehicle emissions budgets act as a "ceiling" for future on-road mobile source emissions. Exceedances of the budget indicate an inconsistency with the SIP, and could lead to a conformity "lapse" and its related consequences if not corrected before the next conformity deadline (e.g., during a lapse, certain categories of transportation projects cannot proceed). As required by the CAA, a comparison of regional on-road mobile source emissions to these budgets will occur during the periodic updates of regional transportation plans and programs.

The on-road motor vehicle emissions estimates for the Final 2012 AQMP were analyzed using CARB's EMFAC2011 emission factors for the transportation activity data provided by Southern California Association of Governments (SCAG) from their adopted 2012 Regional Transportation Plan (2012 RTP). This update which is in response to the Subpart-4 requirements replaces the on-road motor vehicle budgets for 2014 with those for 2015 the revised attainment date. The PM2.5 emissions budgets for PM2.5, and the PM2.5 precursors, VOC and NOx, are derived from the annual average inventory.

This approach is consistent with U.S. EPA's transportation conformity rule, which provides that if emissions budgets rely on new control measures, these measures must be specified in the SIP and the emissions reductions from each control measure must be quantified and supported by agency commitments for adoption and implementation schedules. Moreover, the rule provides that conformity analyses by transportation agencies may not take credit for measures which have not been implemented unless the measures are "projects, programs, or activities" in the SIP supported by written implementation commitments by the responsible agencies (40 CFR 93.122(a)(3)). The emissions budgets for PM2.5 are provided for the 2015 attainment year. However, since transportation analyses are needed beyond the attainment dates, the carrying capacities for the PM2.5 attainment demonstration also serve as the budgets for future years. For transportation conformity analysis, a trading mechanism can be established based on the PM2.5 forming potential developed through the modeling analysis for the emission budgets for various pollutants in SCAB.

2015 VMT AND MOTOR VEHICLE BUDGETS

As previously stated, the 2014 motor vehicle emissions budgets were based on 2012 RTP Final annual average VMT data provided by SCAG. At that time, SCAG provided VMT projections for several milestone years including 2019. Attachment D of Appendix III of the 2012 AQMP

lists the VMT distributions and on-road emissions by vehicle category generated by EMFAC11 using the 2012 RTP VMT for the two years.

The 2015 VMT distribution was interpolated from the 2012 RTP analysis years 2014 and 2019 profiles provided by SCAG. The 2015 VMT derived from the interpolation was input to EMFAC11 to generate the 2015 on-road motor vehicle emissions budgets listed in Table C-1.

TABLE C-1

2015 Motor Vehicle Emissions Budgets: PM2.5
(Annual Average - Tons Per Day)*

	VOC	NOx	PM2.5
Baseline EMFAC 2011	114.26	265.94	11.74
RFG	-4.27	--	--
SMOG Check	-4.75	-2.60	--
PM2.5: Re-entrained Road Dust (paved)	--	--	7.29
PM2.5 Re-entrained Road Dust (unpaved)	--	--	0.58
Road Construction Dust	--	--	0.22
2015 Mobile Source Emission Budget**	**106**	**264**	**20**

*Rounded up to the nearest whole number
**2015 budget is applicable to all future years beyond 2015.

In the Final 2012 AQMP the approximate weighting ratios of the precursor emissions for 24-hour PM2.5 formation in equivalent tons per day of NOx are: VOC: 0.3 (reducing one ton of VOC is equivalent to reducing 0.3 ton of NOx), NOx: 1.0, and PM2.5: 14.8 (i.e., reducing one ton of PM2.5 is equivalent to reducing 14.8 tons of NOx). This mechanism allows emissions below the budget for one pollutant to be used to supplement another pollutant exceeding the budget based on the ratios established herein. Clear documentation of the calculations used in the trading should be included in the conformity analysis. This trading approach is consistent with what U.S. EPA approved in 2011, The Revisions to the 2007 PM2.5 SIP, where the precursor substitution methodology was established.

The basic trading ratios are defined by the 24-hour PM2.5 regional modeling attainment demonstration. Briefly, NOx emissions reductions are scaled to the reduction of Basin ammonium nitrate (including water bonding). Similarly, reductions of VOC are scaled to changes in the organic carbon species while reductions in directly emitted particulates are scaled

to the projected changes in the elemental carbon and "others" portions of the PM2.5 mass. Table C-2 summarizes the trading equivalencies in TPD.

TABLE C-2

Trading Equivalencies for PM2.5Motor Vehicle Emissions Budgets

ONE TON OF	IS EQUIVALENT IN TERMS OF PM2.5 FORMATION TO THIS MANY TONS OF		
	NOx:	**VOC:**	**PM2.5:**
NOx	1	3.151	0.067
VOC	0.317	1	0.021
PM2.5	14.833	46.792	1

An example of how the trading mechanism would work follows; If the amount of NOx calculated exceeds the budget by 0.75 TPD, then that overage could be offset by trading 2.36 TPD of excess VOC emissions reductions (e.g 3.151 VOC/1 ton of NOx x 0.75 TPD NOx required = 2.36 TPD VOC). In this case, "excess" VOC emission reductions would be those beyond what are needed to meet the VOC budget. Similarly 0.050 TPD of directly emitted PM2.5 emissions below the budgeted amount could also be traded to the NOx emissions category and subtracted from the NOx total to allow NOx to meet its budget. In other words, the trading mechanism can be multi-pollutant and multi-directions. It should be noted that the trading calculations are performed prior to the final rounding to demonstrate conformity with the budgets.

ATTACHMENT D

UPDATED RACM/RACT ANALYSIS

INTRODUCTION

In accordance with the April 25, 2014 final rule "Identification of Nonattainment Classification and Deadlines for Submission of State Implementation Plan (SIP) Provisions for the 1997 Fine Particle (PM2.5) National Ambient Air Quality Standard (NAAQS) and 2006 PM2.5 NAAQS," (79 FR 31566; June 2, 2014), under Subpart 4, the South Coast Air Basin (Basin) is classified as a "moderate" non-attainment area with respect to the 2006 24-hour PM2.5 NAAQS. The EPA Final Rule requires that areas classified as moderate nonattainment or higher to develop and submit a demonstration that their current air pollution rules fulfill the 24-hour PM2.5 Reasonably Available Control Measures (RACM)/ Reasonably Available Control Technology (RACT) assessment. The RACM/RACT analysis provides a comparison of the SCAQMD rules and regulations governing precursor emission limits to those established by U.S. EPA guidance and representative agencies within California and elsewhere throughout the U.S. As a component of the 2012 Air Quality Management Plan (AQMP), a RACM/RACT Demonstration for 24-hour PM2.5 was submitted to U.S. EPA for inclusion in the California SIP.

This PM2.5 RACM/RACT analysis serves as a supplement to the 2012 AQMP submittal to review and where applicable update the SCAQMD toolkit to advance emissions controls to meet the current state of the science.

REGULATORY HISTORY

RACM/RACT analyses were incorporated as components of the 2007 and 2012 Air Quality Management Plan (AQMP). The 2007 demonstration was a comprehensive analysis conducted to identify and select control measures to reduce ozone and particulate precursors NOx, VOC, SOx and particulate emissions (to meet the 8-hour ozone and annual PM2.5 standards). The 2007 RACM/RACT analysis focused on rules, Control Technique Guidelines (CTGs) and Alternative Control Techniques (ACTs) adopted through 2006. The analysis identified one SCAQMD rule that required additional evaluation. The 2007 AQMP RACM/RACT analysis was approved by U.S. EPA for inclusion in the SIP in 2011.

The 2012 RACM/RACT analysis focused on precursors of PM2.5 (including ammonia, NOx, SOX, VOC and particulate matter) to attain the 24-hour average PM2.5 standard. From 2006 through 2012, 12 CTGs and ACTs were updated. To address this, the 2012 RACM/RACT analysis evaluated more than 100 rules and regulations, and 100 control measures developed in the 2007-2012 timeframe by other air districts in the nation. Through this analysis, ~~two~~ three additional rules (SCAQMD Rules 1115, 1130 and 1168) were targeted for further evaluation and potential rule development. The 2012 RACM/RACT analysis was submitted to U.S. EPA where evaluation and approval is pending.

Subsequently in July 2014, the SCAQMD submitted a RACT SIP update to U.S. EPA as a component of the 2016 AQMP. The 2016 RACT analysis built upon the 2007 and 2012 RACM/RACT assessments focuses on recently adopted rules and regulation by other agencies in California and the nation. It is important to note that no additional CTG or ACTs were released since the 2012 evaluation. The 2016 RACT analysis evaluated more than 30 rules that were recently developed/amended by other ozone nonattainment air districts from September 2012 through November 2014 and identified six SCAQMD rules that have discrepancies with the companion rules at other California agencies.

Table D-1 summarizes the number of rules assessed between the two prior RACM/RACT analyses. Overall, the three assessments concluded that the SCAQMD's rules and regulations were for the most part equivalent to, or more stringent than other districts' rules and regulations and their proposed control measures in their respective SIPs. Several of the SCAQMD rules identified for evaluation have been amended to address the targeted issue.

The 2007 RACM/RACT assessments "Appendix VI: Reasonably Available Control Measures (RACM) Demonstration" is available at:
http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2007-air-quality-management-plan/2007-aqmp-appendix-vi.pdf?sfvrsn=2

The 2012 RACM/RACT assessments "Appendix VI: Reasonably Available Control Measures (RACM) Demonstration" is available at:
http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2012-air-quality-management-plan/final-2012-aqmp-(february-2013)/appendix-vi-final-2012.pdf

The 2016 AQMP RACT Analysis, Governing Board Letter, and Resolution are available at:
http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2014/2014-jun6-031.pdf?sfvrsn=2

RACM/RACT EVALUATION UPDATE

This addendum to the 2012 RACT demonstration provides another update to the corresponding analyses discussed above. According to the 2013 Annual Emissions Report (AER), there are 25 major source facilities of PM2.5 or precursors (> 100 TPY of ROG, NOx, SOx or TSP) in the Basin. New sources or sources undergoing modification/relocation after the previous RACT determination are subject to Best Available Control Technology (BACT), Best Available Retrofit Control Technology (BARCT) or Lowest Achievable Emissions Rate (LAER) requirement, which are more stringent than RACT. The current update evaluated rules governing emissions limits and modes of operation for the five precursor emissions categories including particulate matter, SOx, NOx, VOCs and ammonia (NH_3). Table D-2 provides a summary of SCAQMD

rules evaluated for PM2.5 precursor emissions control effectiveness. Since the 2012 AQMP submittal, the U.S. EPA has not issued new CTGs or ACTs documents for VOC and NOx sources. SCAQMD rules applicable to major source facilities were determined RACT in the 2007/2012 RACM/RACT assessments. Table D-3 provides an updated brief discussion of the RACT issues for rules identified for further evaluation in the three demonstrations. In particular, the 2016 8-hour ozone RACT update identified six SCAQMD rules that have discrepancies with companion rules at other California Agencies. Staff has completed their initial assessment and two rules may potentially require updating and amendment:

- **Rule 2002** – The current NOx emissions rate limit for cement kilns in SCAQMD is slightly higher when compared to the Bay Area AQMD Regulation 9, Rule 13 (2.73 vs, 2.3 lbs/ton of clinker). The RECLAIM program is currently being evaluated to establish new BARCT emissions limits and facility allocations. The proposed new limit (0.5 lbs/ton clinker) exceeds RACT. The proposed amendment to the NOx RECLAIM is underway and is scheduled for adoption in the second quarter of 2015.

- **Rule 1115** - Rule 1115 is not as stringent as the 2008 EPA CTG for a few coating processes for facilities emitting > 15 lbs/day. Staff will commit to further rule evaluation.

Tables D-4 through D-8, provide the specific RACT analysis for particulate matter, SOx, NOx, VOC and NH3 rules and regulations, respectively. In the tables a rule is specifically designated to meet RACT if the applicable CTG or ACT is met and has been approved in the 2007 SIP. The category defined as RACT Equivalent has been designated to delineate if the rule meets the RACT criteria but has minor differences in application and implementation at other agencies. Where a rule has been identified as undergoing amendment or has been targeted for further evaluation, a brief description of the issues and current/future actions are discussed. As previously stated, the SCAQMD's rules and regulations were for the most part equivalent to, or more stringent than other districts' rules and regulations.

Ammonia is currently regulated in the South Coast Air Basin through existing SCAQMD rules (see Table D-8) and is included as part of the control strategy in the 2012 AQMP, specifically control measure BCM-04 (*Further Ammonia Reductions from Livestock Waste*) listed in Table F-1 in Attachment F. Potential ammonia controls are also evaluated under the updated RACM/RACT Analysis (see Table D-8). But note that as discussed in Attachment E, ammonia controls are much less effective at reducing ambient PM2.5 levels than other precursors. Also note that the South Coast Air Basin is currently close to meeting the 24-hour PM2.5 standard (see "Air Quality Monitoring Data" on page 4 of the Supplement) and anticipated to meet the standard this year (see Attainment Demonstration in Attachment A). Under the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990 (57 FR 13498 at 13560 (April 16, 1992), ''where measures that might in fact be available for implementation in the nonattainment area could not be implemented on a schedule that would

advance the date for attainment in the area, EPA would not consider it reasonable to require implementation of such measures.'' Given that the U.S. Court of Appeals (*Nat'l Res. Def. Council v. EPA*, 706 F.3d 428 (D.C. Cir. 2013)) decided in January 2013 to compel U.S. EPA to apply Subpart 4 planning provisions to PM2.5, the resulting withdrawal of the EPA Implementation Guidance occurred in June 2013, the re-classification of the South Coast PM2.5 nonattainment area to Moderate was finalized in July 2014, and the fact that rulemaking takes many months to complete, no new potential measures identified in the current RACM/RACT analysis could possibly be implemented in time to advance the attainment date to 2014. As such, no further measures beyond the control strategy in the 2012 AQMP are being proposed at this time as a result of the RACM/RACT analysis.

SUMMARY

This analysis updates the three preceding RACM/RACT and RACT analyses. Overall, the SCAQMD makes the following general findings:

1. SCAQMD's rules, meet the U.S. EPA's criteria for RACT acceptability equaling or exceeding applicable CTG and ACT specifications and demonstrating comparable emissions limits and requirements to other agency rules.
2. The RACT analysis covers all 5 PM2.5 precursor emissions categories.
3. All new major sources in the Basin are subject to BACT under NSR, which is by definition more stringent than RACT.
4. SCAQMD commits to further evaluate the rules identified above for potential emission reductions as part of the 2016 AQMP control development.

TABLE D-1

Summary of Recent SCAQMD RACT and RACM/RACT Analyses

SIP	TYPE SUBMITTAL	STATUS	NUMBER OF SCAQMD RULE/ REGULATIONS EVALUATED	NUMBER OF UPDATED CTGS/ACTS ASSESSED	RULES REQUIRING FURTHER EVALUATION
2007	RACM/RACT	EPA Approval 11/09/11	82	4	Rule 1130
2012	RACM/RACT	Pending	>100	12	Rule 1130 Rule 1115 Rule 1168
2016	RACT	Pending	20	0	Rule 223 Rule 462 Rules 1112/2002 Rules 1118/1150.1 Rule 1130 Rule 1148.1

TABLE D-2

Summary of SCAQMD Rules Evaluated For PM2.5 Precursor Emissions Control Effectiveness

PRECURSOR	NUMBER OF APPLICABLE SCAQMD RULES	DIRECT SOURCE RULES	~~INDIRECT~~ DISTRICT MOBILE SOURCE RULES	PROHIBITIONS	AMENDED SINCE 2006
PM	27	15	5	7	7
SOx	13	6	5	2	1
NOx	22	15	5	2	10
VOC	57	52	5	0	21
NH3	5	5	0	0	3

TABLE D-3

Updates of the Rules Further Evaluated in the 2012 RACT/RACM Demonstration and 2016 RACT Analysis

RULE(S)	SCAQMD EVALUATION
223	Rule 223 meets RACT through its implementation of technically feasible mitigation measures. The focus of the SJVAPCD rule is not applicable in the Basin for dry feed operations.
462	Rule 462 is more stringent than the CTG and meets the core requirements for RACT but not as stringent as BAAQMD Rule 8-33 with respect to the emissions limit for Class A facilities. Staff will commit to further rule evaluation.
1112/2002	Cement Kiln emissions limits were evaluated as part of the 2005 RECLAIM (Rule 2002) update. RECLAIM is currently being evaluated to establish new BARCT emissions limits and facility allocations. The proposed new limits exceed RACT. The RECLAIM amendment is projected to be considered for adoption by the second quarter of 2015.
1115	Rule 1115 is not as stringent as the 2008 EPA CTGs for a few coating processes for facilities emitting > 15 lbs/day. The two facilities subject to Rule 1115 have a small emission inventory of about 0.02 tpd. Staff will commit to further rule evaluation.
1118/1150.1	Rule 1118 was determined to be RACT from the 2007 SIP targeting flare emissions from refinery. SJVAPCD Rule 4311 (exempting municipal landfills) applies to other sources > 10 TPY. SCAQMD has a small inventory of flare emissions from sources other than refinery and landfill (regulated by Rule 1150.1). Rules 1118 is consistent with SJVAPCD Rule 4311 and therefore meets RACT.
1130	Rule 1130 was recently amended to reduce fountain solution VOC content to between 16-85 g/L with optional control device efficiency of 90-95%. The rule meets current CTG specifications.
1148.1	Glycol dehydrators in gas and oil production regulated by VCAPCD's Rule 71.5 are jointly regulated by SCAQMD Rules 1148.1 and Rule 1173 (Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants) which meet RACT.
1168	Staff has completed its evaluation and is proposing to reduce primer VOC limits to 250 g/L to meet the CTG. Additional VOC reductions to emissions limits are proposed that will exceed RACT. The Rule is expected to be considered 1st quarter 2015.

All the SCAQMD rules in Tables D-4 through D-8 have been SIP approved except for the following rules (*adoption/last amendment date*): Rules 223 (*5/2/2014*), 444 (*1/9/2009*), 469 (*2/13/1981*), 1110.2 (*10/20/1978*), 1111 (*9/7/2012*), 1112 (*9/5/2014*), 1113 (*6/6/1986*), 1116.1 (*9/9/2011*), 1122 (*11/7/2014*), 1125 (*6/16/2000*), 1130 (*6/16/2000*), 1147 (*7/9/2010*), 1149 (*10/20/2000*), 1153.1 (*5/5/2006*), 1155 (*7/12/2013*), 1166 (*9/6/2013*), 1168 (*5/1/2009*), 1171 (*3/7/2008*), 1183 (*5/2/2014*), 1186.1 (*5/2/2008*), 1191 (*5/11/2001*), 1192 (*1/7/2005*), 1193 (*5/1/2009*), 1194 (*3/12/1993*), 1195 (*6/2/2006*).

TABLE D-4
Evaluation of SCAQMD Particulate Matter (PM) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1105.1	PM	Reduction of PM10 and Ammonia Emissions From Fluid Catalytic Cracking Units (Adopted 11/7/03)	0.005 grain/dscf PM10 and 10 ppmv NH3 slip		Meets RACT
1112.1	PM	Emissions of Particulate Matter from Cement Kilns (Amended 12/4/09)	Applicable to gray cement only. 0.4 lbs PM/tons of kiln feed for kilns rating less than 75 tons per hour; or 30 lbs per hour for kiln rating of 75 tons per hour or more.	Note: Companion Rule 1156 has more stringent PM limit than this rule.	Meets RACT
1133, 1133.1, 1133.2 1133.3	PM	Rule 1133 - Composting and Related Operations – General Administrative Requirements (Adopted 1/10/03) Rule 1133.1 – Chipping and Grinding Activities (Amended 7/8/11) Rule 1133.2 - Emission Reductions from Co-Composting Operations (Adopted January 10, 2003) Rule 1133.3 - Emission Reductions from Greenwaste Composting Operations (Adopted July 8, 2011)	Various performance standards. Air pollution control must have 80% control efficiency or greater. Existing operations must reduce up to 70% baseline VOC and ammonia emissions. Baseline emission factors are 1.78 lbs VOC/ton throughput and 2.93 lbs NH3/ton throughput. Rule 1133.3 establishes operational best management practices (BMPs) for greenwaste composting operations. If the facility processes more than 5,000 tons per year of foodwaste, any active phase of composting containing more than 10% foodwaste, by weight, must use an emission control device with	San Joaquin Rule 4565 – Biosolids, Animal Manure, and Poultry Litter Operations (Adopted 3/15/07) and Rule 4566 – Organic Material Composting Operations (Adopted 8/18/11) have various operational requirements for these operations as well as the operators who landfills, composts, or co-composts these materials. The applicability of Rules 4565/4566 is broader than the applicability of Rule 1133.3. Rules 4565/4566 include additional mitigation measures to control VOC from composting active piles (e.g. maintain minimum oxygen concentration of 5%, moisture content of 40%-70%, carbon to nitrogen ratio of 20-1).	RACT Equivalent. There is no federal policy or guidance describing RACT for this source category. In April 2012, USEPA determined that Rules 1133.1 and 1133.3 fulfill RACT requirements. Rules 1133 and 1133.2 were determined to meet RACT in November 2003. San Joaquin adopted analogous requirements for this source category (Rule 4565) in 2007. SCAQMD Rule 1133.2 is more stringent than San Joaquin's Rule 4565 for larger co-composting

TABLE D-4 *(continued)*
Evaluation of SCAQMD Particulate Matter (PM) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
			an overall control efficiency of at least 80% by weight of VOC.		facilities and less stringent for smaller co-composting facilities. While SCAQMD Rule 1133.2 requires either 70 or 80% overall emission reductions from all parts of composting process, San Joaquin's Rule 4565 requires add-on controls to apply only to the active composting phase. Rule 1133.2 also has more stringent requirements for in-vessel composting. San Joaquin's rule does not address chipping & grinding as in Rule 1133.1. Based on the above information, Rules 1133, 1133.1, 1133.2 and 1133.3 demonstrate RACT equivalency for this source category.

TABLE D-4 *(continued)*
Evaluation of SCAQMD Particulate Matter (PM) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1137	PM	PM10 Reduction From Woodworking Operations (Adopted 2/1/02)	Good housekeeping practices	Rule 1156 contains emission standard for baghouses.	Meets RACT
1138	PM	Control Of Emissions From Restaurant Operations (Adopted 11/14/97)	Require catalytic oxidizer for chain-driven charbroilers. Exemption provided for under-fired charbroilers and units cooking less than 875 lbs/week.	Ventura Rule 74.25 (Adopted 10/12/04) has equivalent requirements as in Rule 1138. Bay Area Rule 2 of Regulation 6 (12/5/07) has emission standards of 0.74 lbs PM10 and 0.32 lbs VOC per thousand pounds of meat cooked for all chain-driven char-broilers; 1.0 lbs PM10 per thousand pounds of meat cooked for all under-fired charbroilers with combined total grill surface area of at least 10 square feet. Most BAAQMD under-fired charbroilers facilities are too small to trigger the under-fired charbroilers requirements.	RACT Equivalent The BAAQMD reported cost-effective values of $17,300/ton of VOC and PM removed for HEPA filters and $19,500/ton of VOC and PM removed for electrostatic precipitators. These cost effectiveness values go beyond RACT.
1140	PM	Abrasive Blasting (Amended 8/2/85)	Visibility standard		Meets RACT
1155	PM	Particulate Matter Control Devices (Amended 5/2/14)	PM standards for PM control devices at 0.01 gr/dcsf for existing large baghouses >7500 square feet. Good operational practices to reduce PM emissions	~~Bay Area amended Regulation 12, Rule 13 on 5/1/2013. The rule is applicable to facilities that melt or process metals (foundries, forges, heat treatment of metals, and metal recycling operations). The rule focuses on emission minimization plans.~~	Meets RACT

TABLE D-4 *(continued)*
Evaluation of SCAQMD Particulate Matter (PM) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1156	PM	PM10 Emission Reductions from Cement Manufacturing Facilities (Amended 3/6/09)	PM standards for PM control devices (0.01 gr/dcsf for existing and 0.005 gr/dcsf for new devices). Good operational practices to reduce PM emissions from aggregate and related operations		Meets RACT
1157	PM	PM10 Emissions Reductions from Aggregate and Related Operations (Amended 9/8/06)	Good operational practices to reduce PM emissions from aggregate and related operations		Meets RACT
1158	PM	Storage, Handling and Transport of Petroleum Coke (Amended 7/11/08)	Reduce PM emissions through good management practices		Meets RACT
1186	PM	PM10 Emissions from Paved and Unpaved Roads, and Livestock Operations (Adopted 7/11/08)	Good management practices		Meets RACT
1186.1	PM	Less Polluting Sweepers (Amended 1/9/09)	Require operators to purchase less polluting or alternative fueled street sweepers.		Meets RACT

TABLE D-4 *(concluded)*
Evaluation of SCAQMD Particulate Matter (PM) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
404, 468, and 469	PM	Rule 404 – Particulate Concentration (Amended 2/7/86) Rule 468 – Sulfur Recovery Units (Amended 10/8/76) Rule 469 – Sulfuric Acid Units (Amended 2/13/81)	PM limits vary from 0.01gr/dscf to 0.19 gr/dscf in Rule 404 depending on exhaust flow rates. Sulfuric acid mist limit in Rule 469 is 0.3 lbs per ton of acid produced (approximately 0.1 gr/dscf) Rule 468 for sulfur recovery units does not contain any PM standard.	Bay Area, Regulation 6, Rule 1 (Adopted 12/5/07) contains the following limits: • PM limit is 0.15 gr/dscf • Sulfuric Acid Manufacturing Plants: limit sulfur trioxide or sulfuric acid mist, or both, expressed as 100% sulfuric acid, to 0.04 gr/dscf • Sulfur Recovery Units: limit sulfur trioxide or sulfuric acid mist, or both, expressed as 100% sulfuric acid, to 0.08 gr/dscf	RACT Equivalent
444	All	Open Burning (Amended 7/12/13)	Contains requirements and prohibitions for open burning to minimize emissions and smoke impacts to the public.	San Joaquin Valley Rule 4103 (Amended 4/15/10) contains additional best management practices compared to Rule 444 such as best management practices to control open burning of weeds. Bay Area, Reg 5, sets requirements for open burning, and was to forbid recreational burning during curtailment periods.	Meets RACT
445	PM	Wood Burning Devices (Amended 5/3/13)	Contains requirements for wood burning devices to minimize emissions and smoke impacts to the public.	San Joaquin Valley Rule 4901 comparable to Rule 445.	Meets RACT

TABLE D-5
Evaluation of SCAQMD Sulfur Oxides (SOx) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1116.1	SOx	Lightering Vessel Operations – Sulfur Content of Bunker Fuel (Adopted 10/20/78)	0.5% sulfur by weight		Meets RACT
1118	All	Refinery Flares (Amended 11/4/05)	• Minimize flare emissions & require smokeless operations • Specify SO2 gradually decreasing performance target to less than 0.5 tons per million barrels of crude by 2012. • If the performance target is exceeded, the operator must 1) pay mitigation fee; or 2) submit a Flare Mitigation Plan to reduce emissions. • Require Cause Analysis for event exceeding 100 lbs VOC, 500 lbs of SO2, or 500,000 scfm of vent gas, excluding planned shutdown, startup and turnarounds • Require 160 ppmv H2S, 3 hour average by 1/1/09, and no limits for NOx, VOC, PM and CO.	U.S. EPA suggested the SCAQMD to further re-evaluate Rule 1118 (FR Vol 76 No 217, Nov 9, 2011, CBE comments). San Joaquin Valley Rule 4311 (Amended 6/18/09) has VOC/NOx limits for ground-level enclosed flares; SO2 Targets (1.50 tons/million barrels of crude by 2011, and 0.5 tons/million barrels by 2012); Flare Minimization Plan for refinery flares more than 5 mmbtu/hr; and operational requirements for all flares that have potential to emit more than 10 tons/yr VOC and more than 10 tons/yr of NOx. Bay Area Rule 12-12 (Adopted 4/5/06) does not specify a declining SO2 target and does not contain a mitigation fee option.	Rule 1118 was determined to be RACT from the 2007 SIP targeting flare emissions from refinery. SJVAPCD Rule 4311 (exempting municipal landfills) applies to other sources > 10 TPY. SCAQMD has a small inventory of flare emissions from sources other than refinery and landfill. Rules 1118 is consistent with SJVAPCD Rule 4311.
1119	SOx	Petroleum Coke Calcining Operations – Oxides of Sulfur (Adopted 3/2/79)	Reduce SOx by 80%		Meets RACT

TABLE D-5 *(continued)*
Evaluation of SCAQMD Sulfur Oxides (SOx) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
2002	SOx	RECLAIM (Amended 11/5/10)	Include facility allocations for SOx for RECLAIM facilities. BARCT Emissions Limits: Calciner, Petroleum Coke • 10 ppmv (0.11 lbs/ton coke) Cement Kiln • 5 ppmv (0.04 lbs/ton clinker) Coal-Fired Boiler • 5 ppmv (95% reduction) Container Glass Melting Furnace • 5 ppmv (0.03 lbs/ton glass) Diesel Combustion • 15 ppmv as required under Rule 431.2 Fluid Catalytic Cracking Unit • 5 ppmv (3.25 lbs/thousand barrels feed) Refinery Boiler/Heater • 40 ppmv (6.76 lbs/mmscft) Sulfur Recovery Units/Tail Gas • 5 ppmv for combusted tail gas (5.28 lbs/hour) Sulfuric Acid Manufacturing • 10 ppmv (0.14 lbs/ton acid produced)	Other Districts do not have RECLAIM. SCAQMD has set most stringent BARCT for SOx sources in the 2010 RECLAIM Amendments.	Exceeds RACT

TABLE D-5 *(concluded)*
Evaluation of SCAQMD Sulfur Oxides (SOx) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
431.1	SOx	Sulfur Content Gaseous Fuels (Amended 6/12/98)	H_2S Limits: Natural gas (16 ppmv) Refinery Gas (40 ppmv) Landfill Gas (150 ppmv) Sewage Gas (40 ppmv) Other Gas (40 ppmv)		Meets RACT
431.2	SOx	Sulfur Content Liquid Fuels (Amended 9/15/2002)	Limit: 15 ppm by weight		Meets RACT
1101	SOx	Secondary Lead Smelters – Sulfur Oxides (Amended 10/7/77)	200 ppmv SOx and 4.2 lbs SOx per ton process weight		Meets RACT
1105	SOx	Fluid Catalytic Cracking Units – Oxides of Sulfur |(Amended 9/1/84)	RECLAIM BARCT limit: Fluid Catalytic Cracking Unit • 5 ppmv (3.25 lbs/thousand barrels feed)	Following the U.S. EPA consent decrees, several refineries in the SCAQMD achieved emission levels as low as 25 ppmv (365 day average) and 50 ppmv (7 day avg) Other Districts do not have RECLAIM. SCAQMD has set most stringent BARCT for SOx sources in the 2010 RECLAIM Amendments	Meets RACT

TABLE D-6
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1109	NOx	Emissions of Oxides of Nitrogen from Boilers and Process Heaters – Petroleum Refineries (Amended 8/5/88)	0.03 lbs/mmBTU of heat input (~25 ppmv). Subsumed by RECLAIM. RECLAIM (amended 1/2005 version) used 5 ppmv for >110 mmbtu/hr and 25 ppmv for units 40-100 mmbtu/hr.	San Joaquin current Rule 4306 limits are 5 ppmv for refinery units > 110 mmbtu/hr, 25 ppmv for units > 65 mmbtu/hr, 30 ppmv for units < 20 mmbtu/hr. For other units, 9 ppmv (or 6 ppmv) for units >20 mmbtu/hr and 15 ppmv (or 9 ppmv) for units from 5-20 mmbtu/hr.	Rule 2002 is currently being evaluated with targeted NOx limits of 2 ppmv for all units > 40 mmbtu.
1110.2	NOx	Emissions from Gaseous and Liquid Fueled Engines (Amended 9/7/12)	Rule 1110.2 has NOx, VOC, CO limits for all stationary and portable engines over 50 brake horse power (bhp). In general, the limits applicable to 1) stationary, non-emergency engines by 7/1/2011, and 2) biogas (landfill and digester gas) engines by 7/1/2012 are: • 11 ppmv NOx • 30 ppmv VOC • 250 ppmv CO	San Joaquin Valley Rule 4702 (Amended 8/19/11) has NOx, VOC, CO and SOx limits for engines rated over 25 bhp. For engines over 50 bhp: - By 1/1/2017, the limits for spark-ignited engines are: • 11 ppmv NOx • 250 ppmv VOC (rich-burn) and 750 ppmv VOC (lean burn), and • 2000 ppmv CO	Meets RACT

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1110.2 (Cont.)	NOx		Limits for new non-emergency engines driving electrical generators are: • 0.07 lbs NOx per MW-hr • 0.20 lbs CO per MW-hr • 0.10 lbs VOC per MW-hr NOx limits for low usage biogas engines: • 36 ppmv, engines ≥ 500 bhp 45 ppmv, engines < 500 bhp VOC and CO limits for low usage biogas engines: • 40 ppmv VOC, landfill gas • 250 ppmv VOC, digester gas • 2000 ppmv CO. Portable and agricultural engines are not subject to the general limits listed above. Many of Rule 1110.2 engines are in RECLAIM, and RECLAIM will be amended to incorporate feasible BARCT.	- Engines used in agricultural operations (AO), or fueled with waste gas, or limited used, or cyclic loaded and field gas fueled are subject to higher limits than the above - In general, all compression ignited engines must meet EPA Tier 4 standards. Engines between 25 bhp - 50 bhp, non agricultural operations (AO), must meet federal standards 40CFR Part 60 Subpart IIII and JJJJ. The SOx limits are: 1) Natural gas, propane, butane, LPG, or combination, or 2) 5 grains/100 scf for gaseous fuel, or 3) 15 ppmv liquid fuel, or 4) CA reformulated gasoline for spark-ignited engines, or 5) CA reformulated diesel for compression ignited engines, or 6) 95% control.	
1111	NOx	NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces (Amended 9/5/14)	40 nanograms per joule heat output until 2015. A lower standard of 14 ng/J is required with staggering compliance dates from 2015-2018.		Meets RACT

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1112	NOx	Emissions of Oxides of Nitrogen from Cement Kilns (Amended 6/6/86)	Applicable to gray cement only. 11.6 lbs/ton clinker averaged over 24 hours and 6.4 lbs/ton clinker averaged over 30 days. Subsumed by RECLAIM. RECLAIM, amended 1/05 version, had no recommendation for cement kiln BARCT. However, RECLAIM BARCT analysis is an on-going process and will be evaluated every three years.	North Central Texas proposes to reduce NOx from cement kilns to 80%-85% using technology such as SCR or LoTOx	Rule 2002 is currently being evaluated with targeted NOx limits of 0.5 lb/ton clinker pulled.
1117	NOx	Emissions of Oxides of Nitrogen from Glass Melting Furnaces (Amended 1/6/84)	4 lb/NOx per ton of glass pulled. Flat glass and fiberglass melting furnaces are exempt. Many of these R1117 units are in RECLAIM. RECLAIM (Amended 1/05 version) had no BARCT recommendation for this class. However, BARCT analysis is an on-going process and will be reevaluated every three years.	San Joaquin Rule 4354 – Glass Melting Furnaces (Amended 8/17/06) have NOx, CO, VOC, SOx limits. For NOx, 4 lb/ton for container glass and fiberglass and 7 lb/ton - 9 lb/ton for flat glass melting furnaces. Since there is a potential to lower the standards through BARCT (e.g. scrubber and SCR), San Joaquin proposes to lower the standards for all glass furnaces in their 2007 AQMP.	Rule 2002 is currently being evaluated with targeted NOx limits of • 0.5 lb/ton container glass pulled, • 1.28 lb/ton glass pulled in a sodium silicate furnace. ÷
1121	NOx	Control of Nitrogen Oxides from Residential Type, Natural-Gas-Fired Water Heaters (Amended 9/3/04)	15 ppmv at 3% O2, dry input (or 10 ng/j output) for all stationary water heaters; and 55 ppmv at 3% O2, dry input (40 ng/j output) for mobile water heaters.	Other Districts' plans propose to accelerate replacements of old water heaters with electric units or new highly-efficient lower-emitting water heaters with the use of incentives.	Meets RACT

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1134	NOx	Emissions of Oxides of Nitrogen from Stationary Gas Turbines (Amended 8/8/97)	Standard = Reference Limit x (Unit Efficiency/25%), where reference limit depends on size of units, varying from 9 ppmv for units rating at equal to or larger than 10MW to 25 ppmv for units rating from 0.3 MW to less than 2.9 MW. RECLAIM, amended 1/2005 version, indicated that 5 ppmv was achieved in practice but not cost effective, therefore did not propose BARCT. This analysis may need to be revised based on new information. RECLAIM BARCT is an on-going process that is planned to be reviewed every 3 years.	Sacramento Rule 413 (Amended 03/24/05) has standards from 9 ppmv – 25 ppmv depending on size of units, but are independent on equipment efficiency. San Joaquin Rule 4703 (Amended 8/17/06) has standards from 5 ppmv – 50 ppmv depending on size of units. Combined cycle units > 10 MW has limit of 3 ppmv. San Joaquin is now proposing to revisit its current rule for further reduction. Ventura Rule 74.9 (Amended 11/08/05) has standards from 25 – 125 ppmv depending on fuel type but are independent from equipment size and efficiency. Control efficiency 90% - 96% control efficiency. In addition, all units have to meet 20 ppmv NH3.	Rule 2002 is currently being evaluated with targeted NOx limits of 2 ppmv for all units.
1135	NOx	Emissions of Oxides of Nitrogen From Electric Power Generating Systems (Amended 7/19/91)	Mass emission limits and emission reduction goals for utility boilers. Only City of Glendale is subject to Rule 1135, which is allowed to meet 0.2 lb/MW-hr (or a daily mass limit of 390 lb NOx per day, or an annual limit of 35 tons per year).	Ventura Rule 59 (amended 7/15/97) requires: • 0.1 lb NOx/MW-Hr for utility boilers and • 0.04 lb/MW-hr for auxiliary boilers. San Joaquin Rule 4306 – Phase 3 (amended 3/17/2005) requires	Rule 2002 is currently being evaluated with targeted NOx limits of 2 ppmv for all units.

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1135 (Cont.)	NOx		Other utility boilers are in RECLAIM subject to declining NOx allocations which were determined based on a level of 7 ppmv (about 0.07 lb/MW-hr assuming a heat rate of 8130 Btu/kw-hr), and are operated at various BARCT levels from 5 ppmv – 30 ppmv.	boilers more than 20 mmbtu/hr to comply with the following options: • Standard option of 9 ppmv (or 0.011 lb/mmbtu) complied by 2005-2007, or • Enhanced option of 6 ppmv (or 0.007 lb/mmbtu) complied by 2006-2008. (Assuming a heat rate of 8130 Btu/kw-hr, 6 ppmv is about 0.06 lb/MW-hr.)	
1146	NOx	Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters (Amended 11/1/2013)	Applicable to units rating of more than 5 mmbtu/hr. Current NOx limits: • For digester gas: 15 ppmv • For landfill gas: 25 ppmv • For refinery gas: 30 ppmv (the 2008 amendment did not revise limits for refinery gas) • For other types of fuels: 5 ppmv for ≥75 mmbtu/hr, natural gas; 30 ppmv for ≥75 mmbtu/hr, other fuels; and 5 or 9 ppmv for 20–75 mmbtu/hr units CO limit: 400ppmv	Sacramento Rule 411 (Amended 10/27/05) limits for gaseous fuel are 9 ppmv for units greater than 20 mmbtu/hr, and 15 ppmv for units from 5 to 20 mmbtu/hr. San Joaquin Rule 4306 (Amended 10/18/08) has the following limits: NOx limits: • 30 ppmv for 5-65 mmbtu/hr units using refinery gas. For units from 40 – 100 mmbtu/hr, refer to the comparison under Rule 1109 • For other types of fuels: 9 ppmv for >20 mmbtu/hr units; 15 ppmv for ≤20 mmbtu/hr units (6 – 9 ppmv for enhanced options) • Other units: 15 – 30 ppmv CO limit: 400 ppmv.	RACT Equivalent

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1146 (Cont.)	NOx		Many Rule 1146 units are in RECLAIM. RECLAIM (Amended 1/05 version) contains the following NOx limits: • For refinery gas: 5 ppmv for units > 110 mmbtu/hr; and 25 ppmv for units < 110 mmbtu/hr units • For other units: 9 ppmv for units > 20 mmbtu/hr; and 12 ppmv for units ≥ 5 mmbtu/hr	San Joaquin Valley further reduces NOx, CO, SO_2 and PM10 emissions by adopting Rule 4320 on 10/16/08. The limits in Rule 4320 are: NOx limits: • For refinery gas: 5 – 6 ppmv for units between 20-110 mmbtu/hr; 6 – 9 ppmv for units between 5 - 20 mmbtu/hr; and 9 ppmv for units firing of less than 50% by vol PUC quality gas. Refer to the comparison under Rule 1109 for 40 mmbtu/hr units and above using refinery gas. • For oil field generators: 5 - 7 ppmv for units greater than 20 mmbtu/hr; 6 – 9 ppmv for units larger than 5 but less than 20 mmtu/hr; and 9 ppmv for units firing of less than 50% by vol PUC quality gas • For low usage units: 9 ppmv • For units at a wastewater treatment facilities firing on less than 50% by vol PUC quality gas: 9 ppmv • For other units: 5 – 7 ppmv for units larger than 20 mmbtu/hr; and 6 – 9 ppmv for units between 5 mmbtu/hr and 20 mmbtu/hr	

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1146 (Cont.)	NOx			Compliance may be mitigated with annual emission fees.	
1146.1	NOx	Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters (Amended 11/1/13)	Applicable to units rating from 2 mmbtu/hr to 5 mmbtu/hr. NOx limits: • Atmospheric Units: 12 ppmv • Digester gas: 15 ppmv • Landfill gas: 25 ppmv • All others: 9 ppmv CO limit: 400 ppmv. Many Rule 1146.1 units are in RECLAIM, and RECLAIM (Amended 1/05 version) BARCT analysis recommended 12 ppmv for less than 5 mmbtu/hr units based on ultra low NOx technology that is achieved in practice. RECLAIM (Amended in 2005) has a limit of 12 ppmv NOx for boilers in this size range.	Bay Area Rule 9-11 (Amended 5/17/00) has following limits for boilers using gaseous fuel 1) 10 ppmv for boilers with rated input greater than 1.75 mmbtu/hr, 2) 25 ppmv for boilers from 1.5-1.75 mmbtu/hr, 3) 30 ppmv for boilers less than 1.5 million btu/hr. Non-gaseous fuel combustion devices have higher limits than gaseous fuel devices. San Joaquin Rule 4307 (Amended 5/19/2011) has the following limits: NOx limits: For New or Replacement Units: Atmospheric Units: 12 ppmv, and Non-Atmospheric Units: 9 ppmv - For Retrofit Units: 30 ppmv burning gaseous fuels; and 40 ppmv burning liquid fuels Sulfur limits for SO2: - For natural gas, propane, butane, or LPG: 5 grains of total sulfur per 100 scf, or 9 ppmv SO2, or 95% control - For liquid fuels: 15 ppmv sulfur	RACT Equivalent

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1146.2	NOx	Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers (Amended 5/5/06)	Applicable to units less than 2 mmbtu/hr. Current limits are: • 20 ppmv for units from 400,000 btu/hr – 2 mmbtu/hr • 55 ppmv for units rating less than 400,000 btu/hr	San Joaquin Valley Rule 4308, (Amended 11/14/13) requires: • 20 ppmv for units used PUC gas from 75,000 btu/hr – 2 mmbtu/hr • 30 ppmv for units from 400,000 btu/hr - 2 mmbtu/hr used other types of fuels • 77 ppmv for units rating from 75,000 btu/hr – 400,000 btu/hr used other types of fuels	Meets RACT
1147	NOx	NOx Emissions from Miscellaneous Sources (Amended 9/9/11)	Current limits are: Gas Fired Equipment: • 60 ppmv for units operating at temperatures ≥ 1200 ^{o} F • 30 or 60 ppmv for units operating at temperatures < 1200 ^{o} F. • 40 ppmv for asphalt Liquid Fuel fired Equipment: • 40 ppmv for units operating at temperatures < 1200 o F • 60 ppmv for units operating at temperatures ≥ 1200 o F • Units less than 1 lb/day compliance delayed until 2017 Mitigation fee option for delayed compliance for multiple units	San Joaquin Valley APCD Rule 4309 (2005) equivalent for asphalt. 40 ppmv for ovens, dehydrators and dryers with no temperature stratification	RACT Equivalent Cooking ovens, dry roasters removed from rule applicability to new Rule 1153.1 (11/7/14) SCAQMD Rule 1147 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1147 is as stringent as or more stringent than the other Districts' rules.

TABLE D-6 *(continued)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1153.1	NOx	Emissions of Oxides of Nitrogen from Commercial Food Ovens (Adopted 11/7/14)	• 40 ppmv for units operating at temperatures $< 500^{o}$ F • 60 ppmv for units operating at temperatures $\geq 500^{o}$ F • CO capped at 800 ppmv • Exemption < 1 lb/day and low use sources • 20 year equipment life • Mitigation fee for alternate compliance plan		Meets RACT
1159	NOx	Nitric Acid Units – Oxides of Nitrogen (Amended 12/6/85)	• 450 ppmv 15 min avg, or • 237 ppmv, 60 min avg; or • 3 lbs/ton acid produced, 60 min average.		Meets RACT
1191	All	Light and Medium Duty Fleet Vehicles (Amended 6/16/00)	Require public fleet to acquire new low emitting gasoline or alternative fuel light and medium duty vehicles.		Meets RACT
1192	All	Clean On-Road Transit Buses (Amended 6/16/00)	Require public fleet to acquire new low emitting or alternative fuel heavy duty vehicles.		Meets RACT
1193	All	Clean On-Road Residential /Commercial Refuse Collection Vehicles (Amended 7/9/10)	Acquire new low emitting refuse collection vehicles.		Meets RACT

TABLE D-6 *(concluded)*
Evaluation of SCAQMD NOx Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1194	All	Commercial Airport Ground Access (Amended 10/20/00)	Acquire new low emitting vehicles that are used for passenger transportation in/out airports.		Meets RACT
1195	All	Clean On-Road School Buses (Amended 5/5/06)	Acquire new low emitting school buses.		Meets RACT
2002	NOx,	RECLAIM (Amended 11/5/10)	Include facility allocations for NOx for RECLAIM facilities	Other Districts do not have RECLAIM, refer to individual rules such as Rule 1146, 1146.1, 1110.2 etc.	BARCT review currently underway. Rule Forecast: Second Quarter 2015
444	NOx	Open Burning (Amended 7/12/13)	Contains requirements and prohibitions for open burning to minimize emissions and smoke impacts to the public.	San Joaquin Valley Rule 4103 (Amended 4/15/10) contains additional best management practices compared to Rule 444 such as best management practices to control open burning of weeds.	Meets RACT
445	NOx	Wood Burning Devices (Amended 5/3/13)	Contains requirements for wood burning devices to minimize emissions and smoke impacts to the public. Restrictis burning during the forecasted episodic curtailment periods.	San Joaquin Valley Rule 4901 (Amended 9/18/14) comparable to Rule 445.	Meets RACT

TABLE D-7
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1102	VOC	Petroleum Solvent Dry Cleaners (Amended 11/17/00)	Maximum usage 15 gals per month and various equipment specifications and operating requirements. Exemptions provided for certain types of dry cleaning provided that detergents and additives must be less than 50 g/L VOC.		Meets RACT
1103	VOC	Pharmaceuticals and Cosmetics Manufacturing (Amended 3/12/99)	For reactors, distillation columns, crystallizers, or centrifuges: 15 lbs/day VOC or use surface condensers. For air dryers: 90% control efficiency or 33 lbs/day VOC. Also include other various operating requirements.		Meets RACT
1104	VOC	Wood Flat Stock Coating Operation (Amended 8/13/99)	2.1 lbs/gal, less water and exempt solvent. In lieu of VOC limit, use control device having 95% control efficiency (or 50 ppmv outlet) and 90% collecting efficiency		Meets RACT
1106	VOC	Marine Coating Operations (Amended 1/13/95)	Coating-specific emission limits from 275 – 780 g/L. In lieu of complying with specific emission limits, operator can use air pollution control system with at least 85% efficiency. Solvent cleaning operations must comply with Rule 1171.	Ventura Rule 74.24 (Amended 9/11/12) generally has the same limits as South Coast Rule 1106, except the limit for special marking of items such as flight decks, ship numbers is 420 g/L (490 g/L in Rule 1106)	Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1106 (Cont.)				Bay Area Rule 8-43 (Amended 10/16/02) generally has the same limits as South Coast Rule 1106, except it has lower limit for pretreatment wash primer at 420 g/L (780 g/L in Rule 1106)	
1106.1	VOC	Pleasure Craft Coating Operations (Amended 2/12/99)	Coating-specific emission limits from 340 – 780 g/L. Solvent cleaning operations must comply with Rule 1171.	San Joaquin Valley's Rule 4603 (Amended 9/17/09) limit for teak primer, wood sealer, and clear wood varnish is 420 g/L, which is more stringent than the limits in Rule 1106.1 (i.e. 775 g/L for teak primer, 550 g/L for clear wood sealers, and 490 g/L for clear wood varnishes.)	RACT Equivalent SCAQMD Rule 1106.1 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1106.1 is as stringent as or more stringent than the other Districts' rules.
1107	VOC	Coating of Metal Parts and Products (Amended 1/6/06)	Coating-specific emission limits from 2.3 lbs/gal – 3.5 lbs/gal. In lieu of complying with specific emission limits, operator can use air pollution control system with at least 95% control efficiency (or 5 ppmv outlet) and 90% capture efficiency. Solvent cleaning operations must comply with Rule 1171.	Ventura Rule 74.12 (Amended 4/8/08) generally has the same coating-specific limits as South Coast Rule 1107, except in the following categories: • Limit for metallic coating is 3 lbs/gal (3.5 lbs/gal in Rule 1107); • Limit for camouflage is 3 lbs/gal (3.5 lbs/gal in Rule 1107);	RACT Equivalent SCAQMD Rule 1107 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1107 is as stringent as or more stringent than the other Districts' rules.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1107 (Cont.)	VOC			• Limit of pretreatment coatings is 2.3 lbs/gal (3.5 lbs/gal in Rule 1107) • Overall minimum control efficiency is 90%, higher than Rule 1107 requirement at 85% San Joaquin Valley Rule 4603 (Amended 9/17/09) have more stringent limits than Rule 1107 for baked camouflage and baked metallic coating at 360 g/L (420 g/L in Rule 1107)	
1108	VOC	Cutback Asphalt (Amended 2/1/85)	0.5% by volume VOC evaporated at 500 degrees F.	Ventura Rule 74.28 – Asphalt Roofing Operations (Adopted 5/10/94) has work practice requirements for asphalt roofing operations. South Coast does not have a similar rule.	Meets RACT
1108.1	VOC	Emulsified Asphalt (Amended 11/4/83)	3% by volume VOC evaporated at 500 degrees F		Meets RACT
1110.2	VOC	Emissions from Gaseous and Liquid Fueled Engines (Amended 9/7/12)	Rule 1110.2 has NOx, VOC, CO limits for all stationary and portable engines over 50 brake horse power (bhp).	San Joaquin Valley Rule 4702 (Amended 11/14/13) has NOx, VOC, CO and SOx limits for engines rated over 25 bhp.	Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1110.2 (Cont.)	VOC		• 11 ppmv NOx • 30 ppmv VOC • 250 ppmv CO Limits for new non-emergency engines driving electrical generators are: • 0.07 lbs NOx per MW-hr • 0.20 lbs CO per MW-hr • 0.10 lbs VOC per MW-hr NOx limits for low usage biogas engines: • 36 ppmv, engines ≥ 500 bhp 45 ppmv, engines < 500 bhp VOC and CO limits for low usage biogas engines: • 40 ppmv VOC, landfill gas • 250 ppmv VOC, digester gas • 2000 ppmv CO. Portable and agricultural engines are not subject to the general limits listed above. Many of Rule 1110.2 engines are in RECLAIM, and RECLAIM will be amended to incorporate feasible BARCT.	• 250 ppmv VOC (rich-burn) and 750 ppmv VOC (lean burn), and • 2000 ppmv CO - Engines used in agricultural operations (AO), or fueled with waste gas, or limited used, or cyclic loaded and field gas fueled are subject to higher limits than the above - In general, all compression ignited engines must meet EPA Tier 4 standards. Engines between 25 bhp - 50 bhp, non agricultural operations (AO), must meet federal standards 40CFR Part 60 Subpart IIII and JJJJ.	

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1113	VOC	Architectural Coatings (Amended 9/6/13)	Coating-specific emission limits from 50 g/L – 730 g/L. Allow averaging, scheduled to be phased out on January 1, 2015. Exempt containers with capacity 2 fluid oz or less.		Meets RACT
1114	VOC	Petroleum Refinery Coking Operations (Adopted 5/3/13)	A delayed coking unit shall depressurize each coke drum to less than two (2) pounds per square inch, gauge (psig) prior to venting it to atmosphere		Meets RACT
1115	VOC	Motor Vehicle Assembly Line Coating Operations (Amended 5/12/95)	Limits from 1.2 lbs VOC/gal coating for electrophoretic primer to 15 lbs/gal of applied solids for primer, primer surfacer and topcoat. Cleaning operations must comply with Rule 1171.	San Joaquin Valley Rule 4602, (Amended 9/17/09) has more stringent limits for: 1) Primer at 0.7 lbs/gal and 2) Primer surface and topcoat at 12 lbs/gal	Rule 1115 is not as stringent as the 2008 EPA CTGs for a few coating processes for facilities emitting > 15 lbs/day. The two facilities subject to Rule 1115 have a small emission inventory of about 0.02 tpd. Staff will commit to further rule evaluation.
1122	VOC	Solvent Degreasers (Amended 5/1/09)	Contain various work practice and design requirements.		Meets RACT
1123	VOC	Refinery Process Turnarounds (Amended 12/7/90)	Vent to storage areas or gas disposal system until pressure in the vessel is below 5 psig or within 5% above the minimum gauge pressure at which the vapors can be collected.	San Joaquin Rule 4454 requires control (vapor recovery and combustion) and depressurization to less than 5 psig. San Joaquin 2007 AQMP control measure proposes to further study the inventory associated with this category.	Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1124	VOC	Aerospace Assembly and Component Manufacturing Operations (Amended 9/21/01)	Coating-specific emission limits from 160 – 1000 g/L. Specific high transfer coating applications (e.g. HVLP spray). In lieu of complying with specific emission limits, operator can use air pollution control system with at least 95% control efficiency (or 50 ppmv outlet) and 90% capture efficiency. Solvent cleaning operations must comply with Rule 1171.	San Joaquin Valley Rule 4605 (Amended 6/16/11) has the following limits that are more stringent than those in Rule 1124: • Flight Test Coatings = 600 g/L (420 g/l for used on missiles and single use target craft, 840 g/L for other flight test coatings in Rule 1124) • Fastener Sealant = 600 g/L (675 g/L for fastener sealant and 600 g/L for other sealants in Rule 1124) Sacramento Rule 456 (Amended 10/23/08) has the following limits that are more stringent than those in Rule 1124: • Conformal Coating = 600 g/L (Rule 1124 limit is 750 g/L) • Fire Resistant Coatings = 600 g/L. (Rule 1124 limits are 650 g/L for Commercial; 800 g/L for Military) • High-Temperature Coating = 420 g/L. (Rule 1124 limit is 850 g/L) • Mold Release Coatings = 762 g/L. (Rule 1124 limit is 780 g/L)	RACT equivalent SCAQMD Rule 1124 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1124 is as stringent as or more stringent than the other Districts' rules.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1124 (con't)	VOC			• Radiation Effect = 600 g/L. (Rule 1124 limit is 800 g/L) • Rain Erosion Resistant Coating = 600 g/L in All Other Category. (Rule 1124 limit is 800 g/L) SCAQMD Rule 1124 has more detailed breakdown of specialty coating categories (primers, coating, adhesives, sealants, maskants, lubricants, cleaning solvents and strippers) than Sacramento Rule 456. A total of 43 sub-categories (27 in Rule 456) was listed in Rule 1124, and most of them are as stringent as, or more stringent than the analogous requirements in Rule 456. For example, Rule 456's VOC limit is 622 and 160 g/l for Type I and Type II chemical milling maskants (250 and 160 g/l for SCAQMD) and 850 g/l for other maskants (varying from 250 to 850 g/l for different sub-categories in SCAQMD). Ventura Rule 74.13 (Amended 9/11/12) requires 200 g/L VOC limit for solvent cleaning or 25 mmHg vapor pressure allowance.	

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1125	VOC	Metal Container, Closure, and Coil Coating Operations (Amended 3/7/08)	Coating-specific emission limits from 0 g/L (for non food cans) – 660 g/L. Specific high transfer coating applications (e.g. HVLP spray). In lieu of complying with specific emission limits, operator can use air pollution control system with at least 95% control efficiency (or 50 ppmv outlet) and 90% capture efficiency, which is equivalent to an overall control efficiency of 85%. Solvent cleaning operations must comply with Rule 1171.	The following limit in San Joaquin Rule 4604 (Amended 9/20/07) are more stringent than those in Rule 1125: • Two-Piece Interior Body Spray = 420 g/L (440 g/L in Rule 1125) • Three-Piece Interior Body Spray = 360 g/L (510g/L in Rule 1125) In addition, SJV Rule 4604 have many limits that are not listed in Rule 1125 such as 20 g/L for end seal compounds and 225 g/L for two-piece interior sheet base coating and over-vanish. Sacramento Rule 452 (Amended 9/25/2008) has the following more stringent limits than Rule 1125: • Two-Piece Interior Body Spray = 420 g/L (440 g/L in Rule 1125) • Three-Piece Interior Body Spray = 360 g/L (510g/L in Rule 1125)	Meets RACT SCAQMD Rule 1125 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1125 is as stringent as or more stringent than the other Districts' rules. Rule 1125 was amended in 2008 to increase control efficiency of treatment systems to 95%.
1126	VOC	Magnet Wire Coating Operations (Amended 1/13/95)	Coating-specific emission limits less than 200 g/L, or use control equipment to achieve equivalent reduction. Solvent cleaning operations must comply with Rule 1171.		Meets RACT (EPA determination 2007)

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1127	VOC	Emission Reductions from Livestock Waste (Adopted 8/6/04)	Good housekeeping practices. Note: The SCAQMD just adopted Rule 223 in June 2006 to reduce emission for large confined animal facilities. Rule 223 includes series of good management practices that are more stringent than Rule 1127.	Sacramento Rule 496 – Large Confined Animal Facilities (Adopted 8/24/06), has more stringent control and good management practices than South Coast Rule 1127 (e.g. venting to control system with at least 80% control efficiency). In the 2007 AQMP, San Joaquin Valley proposed to increase the number of good management practices and control efficiency as called for in their existing rule.	Meets RACT Rule 1127 and 223 together are as stringent as other Districts' rules.
1128	VOC	Paper, Fabric and Film Coating Operations (Amended 3/8/96)	Coating-specific emission limits from 20 – 265 g/L. Specific high transfer coating applications (e.g. HVLP spray). Alternatively, operator can also use control system with at least 95% control efficiency (or 50 ppmv outlet) and 90% capture efficiency. Solvent cleaning operations must contain 15% or less VOC or 85% VOC must be collected and disposed of.	Midwest RPO proposes 100% capture and 90% - 95% control efficiency for existing sources and 97% for new/reconstructed sources.	RACT equivalent District rule is more stringent than the 2007 EPA CTG. The incremental increase from 85% to 90%-97% in control efficiency is not cost-effective for the existing sources in the South Coast air basin.(note) Note: Per communication with Bill Milner on February 13, 2007.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1130	VOC	Graphic Arts (Amended 5/2/14)	VOC content limits: 16 g/l – 185 g/l for fountain solution, 150 g/l for adhesives, 225 g/l - 300 g/l for inks and coatings. In lieu of meeting specific emission limits, control device with overall control efficiency from 90% - 95% can be used to achieve equal or better emission reductions. VOC limits for cleaning solutions for printing presses are in Rule 1171 ranging from 25 g/l (0.21 lb/gal) for flexographic printing to 100 g/l (0.83 lb/gal) for lithographic printing (even though 500 g/l is allowed up to end of year 2007.) Rule 1130 was recently amended to reduce fountain solution VOC content to between 16-85 g/L with optional control device efficiency of 90-95%. The rule meets current CTG specifications.	The U.S. EPA CTG for lithographic and letterpress, September 2006, recommends: • Destruction efficiency of 90% to 95% depending on the date of installation (or 20 ppmv VOC outlet concentration) for heat-set web offset presses with potential to emit, prior to controls, of at least 25 tpy. • For all operations emitting 15 lb/day, requirements for fountain solution are: • 1.6% by weight alcohol or less as applied, or 3% if refrigerated chiller is used, or 5% alcohol substitute for heat-set web presses; • 5% alcohol for sheet-fed presses; • 5% alcohol substitute and no alcohol in fountain solution for cold-set web presses.	Meets RACT SCAQMD Rule 1130 was recently amended (05/02/14) and is equivalent to CTG requirements.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1130 (Cont.)				Bay Area, Regulation 8, Rule 20 (Amended 11/19/08) requires 8% VOC content in fountain solution. In addition, the rule requires recordkeeping for digital printing, cleaning and stripping of UV or electron beam-cured inks for further study potential emission reductions in a near future. Ventura Rule 74.19 (Amended 6/14/11) requires low VOC content in fountain solution used in lithographic presses. In addition, the U.S. EPA CTG for lithographic and letterpress, September 2006, recommends: • Destruction efficiency of 90% to 95% depending on date of installation (or 20 ppmv outlet concentration) for heat-set web with potential to emit, prior to controls, of at least 25 tpy. • For operations emitting 15 lb/day, fountain solution must be 1) 1.6% alcohol or less, or	

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1130 (Cont.)				2) 3% with refrigerated chiller or 3) 5% alcohol substitute for heat-set web presses; 4) 5% alcohol for sheet-fed presses; 5) 5% alcohol substitute and no alcohol in fountain solution for cold-set web presses. The EPA CTG for rotogravure and flexographic, adopted in September 2006, recommends control efficiency of 80% for presses installed after March 1995, and 65% - 75% for older presses.	
1130.1	VOC	Screen Printing Operations (Amended 12/13/96)	VOC content limits ranges from 400 g/L – 800 g/L for materials used in screen printing. In lieu of specific emission limits, control device can be used to achieve equal or better reductions, at least 95%.	Bay Area, Regulation 8, Rule 20 (Amended 11/19/08) has more stringent limit for adhesives at 150 g/L (400 g/L in Rule 1130.1). Sacramento Rule 450 (Amended 10/23/08) has more stringent limits than Rule 1130.1 in the following areas: 1) limit for electronic circuit ink is 800 g/L (850 g/L in Rule 1130.1); 2) limit for adhesives is 150 g/L (400 g/L in Rule 1130.1)	Meets RACT SCAQMD Rule 1130.1 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1130.1 is as stringent as or more stringent than the other Districts' rules.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1131	VOC	Food Product Manufacturing and Processing Operations (Amended 6/6/03)	VOC content limits from 120 – 200 g/L, or air pollution control system with at least 95% control efficiency and 90% capture efficiency. Solvent cleaning operations must contain 15% or less VOC or 85% VOC must be collected and disposed of.		Meets RACT
1132	VOC	Further Control of VOC from High Emitting Spray Booths (Amended 5/5/06)	Further reduce emissions by 65% from the baseline primarily through the installation of control devices, beyond and above the use of coatings that comply with existing coating rules.		Meets RACT
1133, 1133.1	VOC	Rule 1133 - Composting and Related Operations – General Administrative Requirements (Adopted 1/10/03) Rule 1133.1 – Chipping and Grinding Activities (Amended 7/8/11)	Various performance standards. Air pollution control must have 80% control efficiency or greater. Existing operations must reduce up to 70% baseline VOC and ammonia emissions. Baseline emission factors are 1.78 lbs VOC/ton throughput and 2.93 lbs NH3/ton throughput.		Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1136	VOC	Wood Products Coatings (Amended 6/14/96)	VOC content limits range from 2.3 – 6.3 lbs/gal VOC. Averaging provisions and add-on control are allowed. Transfer efficiency is at least 65%, or operator must use certain type of equipment (e.g. HVLP). Solvent cleaning operations must comply with Rule 1171.	Ventura Rule 74.30 (Amended 6/27/06) has more stringent limit for high-solid stains on new wood products at 2 lbs/gal (2.9 lbs/gal in Rule 1136). In lieu of coating specific limits, control equipment achieving 90% efficiency is required. No averaging provisions in Ventura. Rule 74.30 has higher emissions limits for refinishing operations. San Joaquin Valley Rule 4606 (Amended 10/16/08) is more stringent in the following areas: • Rule 1136 allows the use of a stripper with limits higher than 350 g/L if the stripper has low vapor pressure of 2 mmHg. SJV does not have this allowance; SJV Rule 4606 requires a min overall control efficiency of 85% - 90% for flat wood paneling products, whereas Rule 1136 does not have control efficiency requirement.Rule 4606 exempts refinishing, replacement, and custom Replica Furniture Operations. SCAQMD Rule 1136 also has a VOC limit of 120 g/L for low-stain barrier coat. This category is	RACT Equivalent SCAQMD Rule 1136 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1136 is as stringent as or more stringent than the other Districts' rules.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1136 (con't)	VOC			not found in SJV/Ventura and it is lower than their general limits. Bay Area, Regulation 8, Rule 32, (Amended 8/5/09) has lower limits for surface preparation and cleanup, including stripping, at 0.21 lbs/gal. Solvent cleaning operations and the storage and disposal of VOC containing materials are subject to Rule 1171 (general limit = 0.21 lbs/gal) in SCAQMD. Bay Area has higher emission limit of clear topcoat (4.6 lbs /gal vs. 2.3 lbs/gal in SCAQMD) for custom furniture Bay Area exempts refinishing, replacement, and custom Replica Furniture Operations.	
1141	VOC	Control of Volatile Organic Compound Emissions from Resin Manufacturing (Amended 11/17/00)	95% - 98% control or 0.12 – 0.5 lbs/1000 lbs of resin produced		Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1141.1	VOC	Coatings and Ink Manufacturing (Amended 11/17/00)	Operational work practices		Meets RACT
1142	VOC	Marine Tank Vessel Operations (Amended 7/19/91)	2 lbs/1000 barrels liquid loaded or 95% emissions reduced		Meets RACT
1141.2	VOC	Surfactant Manufacturing (Amended 1/11/02)	95% control or 0.5 lbs/1000 lbs of surfactant produced		Meets RACT
1143	VOC	Consumer Paint Thinners and Multi-purpose Solvents (Amended 12/3/10)	Set VOC content of 25 g/l for consumer paint thinner and multi-purpose solvent beginning 1/1/2011		Meets RACT
1144	VOC	Metalworking Fluids and Direct-contact Lubricants (Amended 7/9/10)	Various limits from 50 g/L – 340 g/L. Add-on control at 90% capture efficiency, 95% control efficiency (or 5 ppmv outlet)		Meets RACT
1145	VOC	Plastic, Rubber, Leather and Glass Coatings (Amended 12/4/2009)	VOC limits: 50–800 lbs VOC per gallon. Avg provisions and add-on control at 95% control efficiency (50 ppmv outlet), 90% capture efficiency. High transfer coating equipment (e.g. HVLP). Solvent cleaning operations must comply with Rule 1171.		Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1145 (Cont.)			VOC limits: 50–800 lbs VOC per gallon. Avg provisions and add-on control at 95% control efficiency (50 ppmv outlet), 90% capture efficiency. High transfer coating equipment (e.g. HVLP). Solvent cleaning operations must comply with Rule 1171.		
1148	VOC	Thermally Enhanced Oil Recovery Wells (Amended 11/5/82)	4.5 lbs/day or less per well		Meets RACT
1148.1	VOC	Oil and Gas Production Wells (Amended 3/5/04)	• Set limits for total TOC of 500 ppm in well cellar; • Requires well head liquid capture; • limits the storage of organic liquids in the well cellar but conditionally allows TOC emissions with control equipment less than 250 ppm for safety considerations • sets requirement for operations at the well head. • Requires 95% control equipment efficiency for natural gas vented to atmosphere	Glycol dehydrators in gas and oil production regulated by VCAPCD's Rule 71.5 are jointly regulated by SCAQMD Rules 1148.1 and Rule 1173 (Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants) which meet RACT	Rule currently being evaluated for amendments ~~in conjunction with Proposed Rule 1148.2~~for further VOC reduction. .

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1149	VOC	Storage Tank Degassing (Amended 5/2/08)	Degassing operations must be controlled such that the VOC concentration within the tank is reduced to less than 5,000 ppmv ~~by control equipment achieving 90% efficiency~~ for a minimum time limit estimated in the rule based on volume of the gas to be freed in the tank and the flow rate through control device.	Ventura Rule 74.26, 74.27 (Adopted 10/12/04) requires degassing of crude oil, gasoline and other high TVP liquid storage tanks be controlled by vapor recovery or flare having 95% control efficiency until the vapor concentration in the tanks is less than 10,000 ppmv. Bay Area Rule 8-10 (Adopted 1/21/04) sets requirements for depressurizing process vessels at petroleum refineries and chemical plants. The gases must be vented to control devices until the vapor concentration in the tanks is less than 10,000 ppmv. Rule development is in progress at San Joaquin to eliminate exemptions and require more stringent VOC control.	RACT Equivalent
1150.1	VOC	Control of Gaseous Emissions from Active Landfills (Amended 4/1/11)	98% control or 20 ppmv non methane organic compounds. 50-500 ppmv total organic compounds above background		Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1151	VOC	Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations (Amended 9/5/14)	VOC content limits range from 250 – 840 grams VOC per liter. Averaging provisions are allowed. High transfer coating equipment (e.g. HVLP) is required. Solvent cleaning operations must comply with Rule 1171.	San Joaquin Valley Rule 4602 (Amended 9/17/09) is more stringent in the following areas: 1) adhesive at 250 g/L (540 g/L in Rule 1151) and 2) truck bed liner coating at 200 g/L (310 g/L in Rule 1151) Sacramento Rule 459 (Amended 8/25/11) is more stringent in the following areas: 1) multi-color coating at 520 g/L for mobile equipment driven on rails (680 g/L in Rule 1151), 2) truck bed liner coating at 200 g/L (310 g/L in Rule 1151) Bay Area, Regulation 8, Rule 45 (Amended 12/3/08) is more stringent in the following areas: 1) VOC limit for surface preparation and cleanup, including stripping, of 0.2 lbs/gal or 2) a minimum 85% overall control efficiency.	RACT Equivalent SCAQMD Rule 1151 varies in stringency when compared to other Districts' requirements. For the majority of the categories, Rule 1151 is as stringent as or more stringent than other Districts' rules.
1153	VOC	Commercial Bakery Ovens (Adopted 1/13/95)	Emission reduction of 70% or more is required for existing ovens emitting between 50 lbs – 100 lbs VOC/day, 95% or more for ovens emitting more than 100 lbs/day, and 95% or more for new ovens.		Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1162	VOC	Polyester Resin Operations (Amended 7/8/05)	VOC limits (monomer content) from 10-48% by weight or alternatively 90% control efficiency for add-on control	Regulation 8, Rule 50 (Amended 12/2/09) is similar to Rule 1162, except the limit for corrosion resistant resin is more stringent at 40% - 46% (48% in Rule 1162). The rule allows some usage of acetone	RACT Equivalent ~~Meets RACT~~
1164	VOC	Semiconductor Manufacturing (Amended 1/13/95)	VOC limit for cleanup solvents is 200 g/L or low vapor pressure of 0.64 psia at 68 degree F. Photoresist applications must be vented to control.		Meets RACT
1166	VOC	Volatile Organic Compound Emissions from Decontamination of Soil (Amended 5/11/01)	Good management practices.	Ventura Rule 74.29 – Soil Decontamination Operations (Amended 4/8/08) has standards for soil decontamination (e.g. 50 - 100 ppmv). Leaking agricultural tanks is exempted. Bay Area Rule 8-40 (Amended 6/15/05) for soil decontamination and tank degassing. All vapor exceeding the specified limit based on organic content and aeration rate must be vented to control devices with ≥ 90% efficiency until meeting 5,000 ppmv. San Joaquin Valley Rule 4651 (Amended 9/20/07) employs good management practices similar to those in SCAQMD. For ex-situ decontamination, VOC emissions must be vented to control devices with 95% efficiency or more.	RACT Equivalent There is no federal policy or guidance describing RACT for this source category Rule 1166 is included in the 2007 RACT/RACM demonstration that was approved by USEPA in 2011.

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1168	VOC	Adhesive and Sealant Applications (Amended 1/7/05)	VOC limits for solvents range from 30 – 775 lbs VOC per gallon. Require the use of high transfer efficiency equipment (e.g. HVLP spray). In lieu of meeting the VOC limits, using add-on control with 80% control efficiency is allowed.	San Joaquin Valley Rule 4653 (Amended 9/16/10) has more stringent limits in the following areas: • 100 g/L for Cellulosic Plastic Welding Adhesive, 100 g/L for Styrene Acrylonitrile Welding Adhesive, and 200 g/L for Reinforced Plastic Composite Adhesive (Rule 1168 limit is 250 g/L limits for all three categories) • Minimum overall control efficiency is 85% (80% in Rule 1168)	Staff has completed its evaluation and is proposing to reduce primer VOC limits to 250 g/L to meet the CTG. ~~Additional VOC reductions to emissions limits are proposed that will exceed RACT. The Rule is expected to be considered 1st quarter 2015.~~
1171	VOC	Solvent Cleaning Operations (Amended 5/1/09)	VOC limits for solvents are 25 g/L in general, and have a 100-800 g/L VOC for specific cleaning operations. In lieu of meeting the VOC limits, add-on control having 90% collection efficiency and 95% destruction efficiency or meeting 50 ppmv outlet concentration can be used. ~~The rule however only requires (70%)(95%) = 66.5% overall control efficiency for graphic arts and screen printing applications~~	The U.S. EPA RACT published in September 2006 limit is 50 g/L or an overall control efficiency of 85%. The U.S. EPA is not recommending limits beyond 50 g/L; but also recommends states to adopt higher limits based on individual performance requirements of specific applications.	Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1173	VOC	Fugitive Emissions of Volatile Organic Compounds (Amended 2/6/09)	• Require to connect atmospheric PRDs to vapor recovery or add-on control by first turnaround, if the facility experiences: • a second release of more than 500 lbs VOC within any five year period, or • any release of 2,000 lbs VOC in any 24 hour period. In lieu of connecting PRDs to control, operator may elect to pay mitigation fee of $350,000 for any release exceeding the threshold. • Leak Detection and Repair (LDAR) program to reduce fugitive emissions. Leak thresholds are: • for light liquid/gas/vapor service >10,000 ppmv, • for PRDs >200 ppmv, • for pumps in heavy liquid >100 ppmv	Bay Area Rule 8-28 (amended 12/21/05) requires atmospheric PRDs to be: • vented to vapor recovery or equivalent control devices that have 95% control efficiency within one year of the second release event of greater than 10 lbs VOC. • equipped with at least two or three redundant preventive measures to minimize episodic releases, and • equipped with tell-tale indicators. North Central Texas – Final 2007 SIP, Oil & Gas Production, Natural Gas Processing, Measure #144. Propose to revise leak definitions and requirements for shorter repair periods based on recently revised San Joaquin Valley Rule 4409, amended July 2004.	Meets RACT

TABLE D-7 *(continued)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1174	VOC	Control of Volatile Organic Compound Emissions from the Ignition of Barbecue Charcoal (Amended 10/5/90)	VOC emissions less than 0.02 lb VOC per start.		Meets RACT
1175	VOC	Control of Emissions from the Manufacture of Polymeric Cellular (Foam) Products (Amended 11/5/10)	VOC limit for expandable polystyrene molding operations is less than 2.4 lbs/100 lbs of raw material processed		Meets RACT
1176	VOC	Sumps and Wastewater Separators (Amended 9/13/96)	• Wastewater: 500 ppmv • Sumps and wastewater separators must have floating cover with seals; or fixed cover vented to control • Sewer lines: totally enclosed • Process drains: with SCAQMD approved water seals • Junction boxes: totally enclosed • Control device: ≥ 95% efficiency or ≤500 ppmv leak above background • Monthly to annually inspection	Bay Area Rule 8-8 (Amended 9/15/04) in general is similar to South Coast Rule 1176, with the following exceptions: • Floating covers must have double seals; and • Semi-annual inspection is allowed. In their 2007 AQMP, San Joaquin Valley proposes to further study the following areas: • Require crude oil production sumps to have fixed roof and vented to control with 99% control efficiency; • Require wastewater separators to have fixed roof and vented to control with 95% control efficiency, and • Require floating roofs to be equipped with double seals	Meets RACT

TABLE D-7 *(concluded)*
Evaluation of SCAQMD VOC Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1177	VOC	Liquefied Petroleum Gas Transfer and Dispensing (Adopted 6/1/12)	The rule specifies tightened connectors (valves and seals) for vapor and liquid transfer from storage tanks to cargo tanks to minimize leakage.		Meets RACT
1178	VOC	Further Reductions of VOC Emissions From Storage Tanks at Petroleum Facilities (Amended 4/7/06)	Applicable to high emitting facility that has 20 tpy VOC emissions or more and tanks >19,815 gals with liquids having TVP > 0.1 psia. Rule 1178 requires doming for high emitting external floating roof tanks, better seals and better control for all tanks. (Note that Rule 463 is applicable for tanks >19,815 gals at all facilities and have requirements for fixed roof tanks and floating roof tanks.)	In the 2007 AQMP, San Joaquin proposes to revise Rule 4623 to lower tank capacity applicability, lower TVP threshold, and revisit exemptions to broaden source applicability. Midwest RPO control measure proposes to expand source applicability of LADCO state rules to include 10,000 gal tanks.	Meets RACT
1179	VOC	Publicly Owned Treatment Works Operations (Amended 3/6/92)	Include recordkeeping requirements.		Meets RACT
1183	VOC	Outer Continental Shelf (OCS) Air Regulations (Adopted 3/12/93)	Adopt by reference Code of Federal, Part 55, Title 40.		Meets RACT
1189	VOC	Emissions From Hydrogen Plant Process Vents (Adopted 1/21/00)	For existing plants, 2.5 lbs VOC per million cubic feet of hydrogen produced. For new plants, 0.5 lbs VOC per million cubic feet of hydrogen produced.		Meets RACT

TABLE D-8
Evaluation of SCAQMD Ammonia (NH_3) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
223	NH3	Emissions Reduction Permits From Large Confined Animal Facilities (Adopted 6/2/06)	Sets permit requirement for new and modified LCAF facilities. Specifics mitigation options by animal and facility type for: • Feed and silage handling, • Milk parlor operations, • Corrals and free stall barn operations, • Handling of manure and solids, • Handling of manure in liquid form • Land application of liquid or solid manure	SJVAPCD Rule 4570 sets comparable permit requirements and mitigation measures.	Rule 223 meets RACT through its implementation of technically feasible mitigation measures. The focus of the SJVAPCD rule is not applicable in the Basin for dry feed operations.
1105.1	NH3	Reduction of PM10 and Ammonia Emissions From Fluid Catalytic Cracking Units (Adopted 11/7/03)	0.005 grain/dscf PM10 and 10 ppmv NH3 slip		RACT Equivalent
1127	NH3	Emission Reductions from Livestock Waste (Adopted 8/6/04)	Set protocol for dairy farm manure removal and processing and sets alternate planning requirements for manure composting	SJVAPCD Rule 4565 and 4566 sets comparable permit requirements and mitigation measures.	RACT Equivalent

TABLE D-8 *(continued)*
Evaluation of SCAQMD Ammonia (NH_3) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1133.2	NH3	Emission Reductions from Co-Composting Operations (Adopted 1/10/03)	Various performance standards. Air pollution control must have 80% control efficiency or greater. Existing operations must reduce up to 70% baseline VOC and ammonia emissions. Baseline emission factors are 1.78 lbs VOC/ton throughput and 2.93 lbs NH3/ton throughput.	San Joaquin Rule 4565 – Biosolids, Animal Manure, and Poultry Litter Operations (Adopted 3/15/07) and Rule 4566 – Organic Material Composting Operations (Adopted 8/18/11) have various operational requirements for these operations as well as the operators who landfills, composts, or co-composts these materials. The applicability of Rules 4565/4566 is broader than the applicability of Rule 1133.3. In addition, Rules 4565/4566 include additional mitigation measures to control VOC from composting active piles (e.g. maintain minimum oxygen concentration of 5%, moisture content of 40%-70%, carbon to nitrogen ratio of 20-1). San Joaquin's rule does not address chipping & grinding as in Rule 1133.1.	RACT Equivalent SCAQMD Rule 1133.2 is more stringent than San Joaquin's Rule 4565 for larger co-composting facilities and less stringent for smaller co-composting facilities. While SCAQMD Rule 1133.2 requires either 70 or 80% overall emission reductions from all parts of composting process, San Joaquin's Rule 4565 requires add-on controls to apply only to the active composting phase. Rule 1133.2 also has more stringent requirements for in-vessel composting.

TABLE D-8 *(concluded)*
Evaluation of SCAQMD Ammonia (NH_3) Rules and Regulations

RULE NO.	TYPE	RULE TITLE	CURRENT RULE REQUIREMENTS	OTHER DISTRICTS' 2000-2014 RULES, CONTROL MEASURES, U.S. EPA CTGS, AND OTHER STUDIES	EVALUATION
1133.3	NH_3	Emission Reductions from Greenwaste Composting Operations (Adopted 7/8/11)	Include requirements for composting greenwaste, or greenwaste in combination of manure or foodwaste. Include various performance standards. Require air pollution control with efficiency of 80% or greater for operations greater than 5000 tons/year of foodwaste. For operations less than 5000 tons/year, require the composting piles to be covered, watered, and turned, or operated with measures that reduce at least 40% VOC emission and 20% NH_3 emissions.		RACT Equivalent

ATTACHMENT E

~~**DEMONSTRATION OF COMPLIANCE WITH**~~
CLEAN AIR ACT, SUBPART 4, SECTION 189(E)
AND OTHER PRECURSOR REQUIREMENTS

BACKGROUND

PM2.5 has four major precursors, other than direct PM2.5 emissions, that may contribute to the development of the ambient PM2.5: ammonia, NOx, SOx, and VOC. The 2012 AQMP modeling analysis resulted in a set of ratios that reflect the relative amounts of ambient PM2.5 improvements expected from reductions of PM2.5 precursors emissions. For instance, Table 5-2 in Chapter 5 of the 2012 AQMP demonstrates that one ton of VOC emission reductions is only 30 percent as effective as one ton of NOx for lowering 24-hour PM2.5 concentrations. VOC reductions are only four percent and two percent as effective as SOx and direct PM2.5 reductions, respectively, on a per ton basis. Thus, VOC controls have a much less significant impact on ambient 24-hour PM2.5 levels relative to other PM2.5 precursors.

EMISSIONS CONTRIBUTION

While similar relative contributions to PM2.5 have not been developed for ammonia, the mass contributions of ammonium sulfate and ammonium nitrate are accounted for in the SOx and NOx contributions. This essentially assumes that PM2.5 formation in the basin is not ammonia limited with sufficient ammonia in the atmosphere to combine with available nitrates and sulfates. Under these conditions, ammonia controls are much less effective at reducing ambient PM2.5 levels than other precursors.

While the 2012 AQMP ammonia emissions inventory was close to 100 ton per day (TPD), the inventory was highly variable in terms of source contributions and spatial distribution throughout the Basin. As presented in Table E-1, major sources accounted for 1.7 TPD or less than 2 percent of the Basin inventory. Furthermore, only four major source emitters were noted in the inventory with the single highest major source accounting for less than 0.50 TPD direct emissions. All four major sources are located in the western Basin.

TABLE E-1

VOC and Ammonia Emissions Contributions

POLLUTANT	ALL SOURCES *(Tons Per Day)*	MAJOR SOURCES *(Tons Per Day)*	RELATIVE CONTRIBUTION
VOC	451[1]	8.0[2]	1.8%
Ammonia	99[3]	1.7[2]	1.7%

[1] 2012 AQMP - Appendix III: Base and Future Year Emission Inventory; 2014 Annual Average Emissions by Source Category in South Coast Air Basin

[2] 2013 SCAQMD Annual Emission Reporting

[3] ARB Almanac 2013 – Appendix B: County Level Emissions and Air Quality by Air Basin; County Emission Trends

Prior to the 2003 AQMP, significant effort was undertaken to develop inter-pollutant trading ratios to meet NSR emissions reduction goals. The primary mechanism was to reduce SOx to offset PM emissions. Aerosol chemical mechanisms embedded in box and regional modeling platforms where used to estimate the formation rates of ammonium sulfate from local sulfur emissions to establish a SOx emissions to PM formation ratio. The analyses determined that the influence of ammonia emissions was spatially varying where coastal-metro zone (west Basin) trading ratios of SOX to PM valued more than 5:1 per unit SOx emissions to PM. Conversely, eastern Basin ratios valued 1:1 since ammonia emissions were abundant and all SOx emissions were likely to rapidly transform to particulate ammonium sulfate. The inter-pollutant trades made during this time were reviewed by U.S. EPA and were included by reference to the EPA sponsored Inter-Pollutant Trading Working Group[4].

As part of the controls strategy evaluation for future PM2.5 attainment, additional set of analyses were conducted to test the potential impact of the use of SCR as a NOx control mechanism for mobile sources in the Basin. The analyses assumed that light as well as heavy duty diesels would use the control equipment potentially resulting in a 78-85 percent increase in ammonia from those source categories. The results of the analysis, presented at the September 24, 2010 SCAQMD Mobile Source Committee Meeting[5], indicated that a 10 TPD increase in ammonia would result in a net 0.22 $\mu g/m^3$ increase in regional PM2.5 concentrations. The emissions mostly followed heavy traffic corridors including freeways and major arterials. Regardless, the minimal PM2.5 simulated increase from a 10 percent increase in the Basin inventory reflected the degree of saturation of ammonia in the Basin and minimal sensitivity of changes in ammonia emissions to PM2.5 production.

During the development of the 2012 AQMP, a sensitivity analysis was conducted to test the potential impact of using a feed supplement applied to dairy cows on a forecasted basis that would reduce bovine ammonia emissions by 50 percent. The analysis focused on the Mira Loma area where more than 70 percent of the Basin's dairy emissions originate. In the sensitivity analysis a total of 2.9 TPD emissions were reduced from 103 dairy sources, or an average of 0.028 TPD per source (roughly one tenth of major source threshold)[6]. Since the Mira Loma monitoring station was embedded among the dairy sources, the reduction of the ground level emissions resulted in an approximate 0.16 $\mu g/m^3$ reduction in PM2.5. As in the aforementioned analyses, the reduction in regional ammonia emissions resulted in a minimal PM2.5 impact per ton emissions reduced.

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and Forecasts 2012 Emissions. NOTE: 2012 AQMP – Appendix III provides 2014 Annual Average of 102 tpd of NH3; the relative contribution would not change (1.7/102 = 1.7%)

[4] "Preliminary Assessment of Methods for Determining Interpollutant Offsets", Correspondence with Scott Bohning U.S. EPA Region IX, May 6, 2002.

[5] "Impact of Higher On- and Off-road Ammonia Emissions on Regional PM2.5," Item 3, SCAQMD, Mobile Source Committee, September 24, 2010.

[6] "2008 24-hour PM2.5 Model Performance/Preliminary Attainment Demonstration," Item #2, Scientific Technical Modeling Peer Group Advisory Committee, June 14, 2012.

Thus, ammonia controls also have a much less significant impact on 24-hour PM2.5 exceedances than other precursors. Note however, that the effect on annual PM2.5 levels will be further evaluated in the 2016 AQMP.

SECTION 189(E)

Clean Air Act (CAA), Title I, Part D, Subpart 4, Section 189(e) states that control requirements applicable to plans in effect for major stationary PM sources shall also apply to major stationary sources of PM precursors, except where such sources does not contribute significantly to PM levels which exceed the standard in the area. According to the U.S. EPA, a major source in a nonattainment area is a source with emission of any one air pollutant greater than or equal to the major source thresholds in a nonattainment area. This threshold is generally 100 tons per year (tpy) or lower depending on the nonattainment severity for all sources. Emissions are based on "potential to emit" and include the effect of add-on emission control technology, if enforceable (*must be able to show continual compliance with the limitation or requirement*).

Major stationary sources of NOx and SOx are already subject to emission offsets (e.g., Regulation XX (RECLAIM) and Regulation XII (New Source Review)). Thus, to demonstrate compliance with CAA Subpart 4, Section 189(e), an analysis was conducted of the emissions of VOC and ammonia from major stationary sources during rule development of amended Rule 1325 (*Federal PM2.5 New Source Review Program*) approved by the SCAQMD Governing Board on December 5, 2014 (http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2014/2014-dec5-038.pdf?sfvrsn=2). That analysis concluded that VOC and ammonia from major sources (emitting 100 tpy or greater) contribute less than 2% of the overall Basin-wide VOC and ammonia emissions (Table E-1), and by extension, do not contribute significantly to PM levels. Furthermore, both VOC and ammonia are subject to requirements for Best Available Control Technology (BACT) under existing New Source Review (NSR) at a zero threshold, so those emission will still be minimized. This analysis was also included in the final approved staff report for PAR 1325.

~~Thus, the SCAQMD believes the requirements of CAA Subpart 4, Section 189(e) are satisfied and thus request that the Administrator of U.S. EPA makes this determination pursuant to this Section.~~

NEW SOURCE REVIEW

Because ammonia from major stationary sources does not significantly contribute to PM levels (see Table E-1), ammonia emission sources have not historically been subject to NSR offset requirements. However, for permitted ammonia sources, SCAQMD Rule 1303 (*NSR Requirements)* requires denial of "the Permit to Construct for any relocation, or for any new or

modified source which results in an emission increase of any nonattainment air contaminant, any ozone depleting compound, or ammonia, unless BACT is employed for the new or relocated source or for the actual modification to an existing source." No new major stationary source of ammonia is expected to be introduced to the region given that these new sources would be subject to BACT requirements (under SCAQMD Rule 1303 (*NSR Requirements*), BACT shall be at least as stringent as Lowest Achievable Emissions Rate (LAER) as defined in the federal Clean Air Act Section 171(3) [42 U.S.C. Section 7501(3)]). As mentioned above, there are currently only four major sources of ammonia (emitting more than 100 tons per year) in the South Coast Air Basin. If these sources were new to the region, they would be subject to BACT as stringent as LAER and not expected to reach 100 tons per year so as to be classified as a major source, thus not subject to NSR offset requirements.

However unlikely, even if new or modified major sources of ammonia increase ammonia emissions in the Basin, the ammonia contribution from major sources in the South Coast Air Basin will still not be a significant contributor to PM2.5 levels given that all current major sources of ammonia account for less than two percent of the overall ammonia emissions inventory. For instance, in the extremely unlikely event that ammonia emissions from major sources double, they would still contribute less than five percent of the overall ammonia inventory.

ATTACHMENT F

UPDATED LIST OF CONTROL STRATEGY COMMITMENTS

UPDATE OF COMMITMENTS

The short-term PM2.5 control measures in the 2012 AQMP included stationary source control measures, technology assessments, an indirect source measure and one education and outreach measure. The development of the control measures considered the emissions reductions and the adoption and implementation dates that would result in attainment of the 2006 24-hour PM2.5 standard of 35 $\mu g/m^3$. In some cases, only a range of possible emissions reductions could be determined, and for some others, the magnitude of potential reductions could not be determined at that time. The short-term PM2.5 control measures were presented in Table 4-2 (Chapter 4) of the 2012 AQMP, and the following table, Table F-1 updates that information, thus replacing Table 4-2 in the 2012 AQMP for inclusion in the 24-hour PM2.5 SIP. Note that these changes do not affect the magnitude or timing of emission reductions commitments supporting the attainment demonstration in the 2012 AQMP and this Supplement. The emission reduction commitment for CMB-01 (Further NOx Reductions from RECLAIM) was as a contingency measure only for PM2.5, and thus does not affect the attainment demonstrations.

The measures target a variety of source categories: Combustion Sources (CMB), PM Sources (BCM), Indirect Sources (IND), Educational Programs (EDU) and Multiple Component Sources (MCS).

Two PM2.5 control measures, BCM-01 (Further Reductions from Residential Wood Burning Devices) and BCM-02 (Further Reductions from Open Burning), were adopted in 2013 in the form of amendments to Rules 445 (Wood Burning Devices) and 444 (Open Burning), respectively. Together, these amendments generated a total of 11.7 tons of PM2.5 per day reductions on an episodic basis. Control measure CMB-01 (Further NOx Reductions from RECLAIM), which was submitted as a contingency measure, is anticipated to be considered by the SCAQMD Governing Board in the first half of 2015. The rulemaking process for control measure IND-01 (Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities) is underway, with anticipated SCAQMD Governing Board consideration in 2015 and the technology assessment for control measure BCM-04 (Further Ammonia Reductions from Livestock Waste) will now be adopted in the 2015 to 2016 timeframe with rulemaking to follow, if technically feasible and cost-effective. The BCM-03 (Emission Reductions from Under-Fired Charbroilers) technology assessment is ongoing and is expected to be completed by 2015 with rule development to follow by 2017.

Pursuant to CAA Section 172(c)(9), SIPs are required to include contingency measures to be undertaken if the area fails to make reasonable further progress or attain the NAAQS by the attainment date. The contingency measures "should provide for emission reductions equivalent to about one year of reductions needed for reasonable further progress (RFP)" (79 FR 20642-20645) The 2012 AQMP relied on excess air quality improvement from the control strategy as well as potential NOx reductions from control measure CMB-01 (Further NOx Reductions from

RECLAIM) to demonstrate compliance with the federal requirement. No additional contingency measure commitment is being proposed in this Supplement.

TABLE F-1

Updated 2012 SIP Emission Reduction Commitments to Attain 24-hour PM2.5 NAAQS *(35 µg/m^3)*

Control Measure #	CONTROL MEASURE TITLE	2012 AQMP			PROPOSED in SUPPLEMENT		
		Adoption Date	COMMITMENT	ACHIEVED	Adoption Date	COMMITMENT	ACHIEVED
			2014	2014		2015	2015
PM2.5 EMISSIONS							
IND-01	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Facilities [R4001]	2013	N/A[1]	N/A[1]	**2015**	N/A[1]	N/A[1]
BCM-01	Further Reductions from Residential Wood Burning Devices [R445]	2013	7.1	7.1	2013	7.1	7.1
BCM-02	Further Reductions from Open Burning [R444]	2013	4.6	4.6	2013	4.6	4.6
MCS-01	Application of All Feasible Measures Assessment	Ongoing	TBD[2]	TBD	Ongoing	TBD[2]	TBD
BCM-03	Emission Reductions from Under-Fired Charbroilers [R1138]	2015	TBD[3]	TBD	**2017**	TBD[3]	TBD
EDU-01	Further Criteria Pollutant Reductions from Education, Outreach and Incentives	Ongoing	N/A[4]	N/A	Ongoing	N/A[4]	N/A
TOTAL PM2.5 EMISSION REDUCTIONS (TPD)			**11.7**	**11.7**	**--**	**11.7**	**11.7**
NOx EMISSIONS							
CMB-01	Further NOx Reductions from RECLAIM [Reg XX]	2013	2.0[5]	--	**2015**	2.0[5]	--
IND-01	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Facilities [R4001]	2013	N/A[1]	N/A[1]	**2015**	N/A[1]	N/A[1]
TOTAL NOx EMISSION REDUCTIONS (TPD)			**2.0**	**--**	**--**	**2.0**	**--**
SOx EMISSIONS							
IND-01	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Facilities [R4001]	2013	N/A[1]	N/A[1]	**2015**	N/A[1]	N/A[1]
TOTAL SOx EMISSION REDUCTIONS (TPD)			**--**	**N/A[1]**	**--**	**--**	**N/A[1]**
NH3 EMISSIONS							
BCM-04	Further Ammonia Reductions from Livestock Waste [R1127] - Phase I (*Tech Assessment*)	2013-2014	TBD[2]	TBD	**2015 - 2016**	TBD[2]	TBD
	-Phase II (*Rule Amendment*)	TBD	TBD[2]	TBD	TBD	TBD[2]	TBD
TOTAL NH3 EMISSION REDUCTIONS (TPD)			TBD	TBD	--	--	--

[1] Measure is designed to ensure reductions assumed to occur will in fact occur
[2] Reductions to be determined once the technical assessment is complete, and inventory and control approach are identified
[3] Will submit into SIP once technically feasible and cost effective options are identified
[4] Reductions cannot be quantified due to the nature of the measure (e.g., outreach, incentive programs)
[5] Emission reductions are included in the SIP as a contingency measure, if triggered

ATTACHMENT C

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • http://www.aqmd.gov

SUBJECT: **NOTICE OF EXEMPTION FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT**

PROJECT TITLE: **SUPPLEMENT TO 24-HOUR PM2.5 STATE IMPLEMENTATION PLAN (SIP) FOR SOUTH COAST AIR BASIN**

Pursuant to the California Environmental Quality Act (CEQA) Guidelines, the South Coast Air Quality Management District (SCAQMD) is the Lead Agency and has prepared a Notice of Exemption for the project identified above.

The SCAQMD has reviewed the proposed project pursuant to CEQA Guidelines §15002 (k)(1) - General Concepts, the first step of a three-step process for deciding which document to prepare for a project subject to CEQA. The proposed amendments do not require any major modifications or changes to existing operations. The SCAQMD has determined that that it can be seen with certainty that there is no possibility that the proposed project may have any significant effects on the environment, and is therefore, exempt pursuant to CEQA Guidelines §15061 - Review for Exemption, paragraph (b)(3) – "general rule" exemption.

A Notice of Exemption has been prepared pursuant to CEQA Guidelines §15062 - Notice of Exemption. If the project is approved, the Notice of Exemption will be filed with the county clerks of Los Angeles, Orange, Riverside and San Bernardino counties.

Any questions regarding this Notice of Exemption should be sent to Michael Krause (c/o Planning, Rule Development and Area Sources) at the above address. Mr. Krause can also be reached at (909) 396-2706 or mkrause@aqmd.gov.

Date: February 6, 2015 **Signature:** 

Michael Krause
Program Supervisor, CEQA Section
Planning, Rules, and Area Sources

Reference: California Code of Regulations, Title 14

NOTICE OF EXEMPTION

To: County Clerks
Counties of Los Angeles, Orange, Riverside and San Bernardino

From: South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Project Title:
Supplement to 24-hour PM2.5 State Implementation Plan (SIP) for South Coast Air Basin

Project Location:
South Coast Air Quality Management District: the four-county South Coast Air Basin (Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties) and the Riverside County portion of the Mojave Desert Air Basin.

Description of Nature, Purpose, and Beneficiaries of Project:

The purpose of this Supplement to the 24-hour PM2.5 SIP for the South Coast Air Basin is to demonstrate attainment of the 2006 24-hour PM2.5 National Ambient Air Quality Standard (NAAQS) by 2015 under Clean Air Act (CAA) Subpart 4, along with a new transportation conformity budget for 2015, analysis of Reasonably Available Control Measures (RACM)/ Reasonably Available Control Technology (RACT), emission reduction commitments submitted in the 2012 AQMP, and other Subpart 4 requirements. In addition, the Supplement includes a discussion of the effects of the drought on a 2014 attainment date.

Public Agency Approving Project:
South Coast Air Quality Management District

Agency Carrying Out Project:
South Coast Air Quality Management District

Exempt Status:
CEQA Guidelines §15002 (k)(1) – General Concepts; and

CEQA Guidelines §15061 (b)(3) – Review for Exemption

Reasons why project is exempt:
The SCAQMD has reviewed the Supplement to 24-hour PM2.5 State Implementation Plan (SIP) for South Coast Air Basin pursuant to CEQA Guidelines §15002 (k)(1) - General Concepts, the first step of a three-step process for deciding which document to prepare for a project subject to CEQA. The SCAQMD has determined that the Supplement is not proposing to add new or delete any control measures from the current 24-hour PM2.5 SIP for South Coast Air Basin that have the potential to have a direct or indirect adverse impact on the environment but merely presents updated analyses and other changes that do not have the potential to cause a direct or indirect adverse impact on the environment, thus it can be seen with certainty that there is no possibility that the proposed project may have any significant effects on the environment, and is therefore, exempt pursuant to CEQA Guidelines §15061 - Review for Exemption, paragraph (b)(3) – "general rule" exemption.

Project Approval Date:
SCAQMD Governing Board Hearing: February 6, 2015, 9:00 a.m.; SCAQMD Headquarters

CEQA Contact Person:	Phone Number:	Fax Number:	Email:
Mr. Michael Krause	(909) 396-2706	(909) 396-3324	mkrause@aqmd.gov

Date Received for Filing: _____ **Signature:** *(To be signed upon project approval)*

Michael Krause, Program Supervisor
Planning, Rule Development & Area Sources

Back to Agenda

BOARD MEETING DATE: February 6, 2015 AGENDA NO. 23

PROPOSAL: Communities for a Better Environment's Request for Hearing Regarding Certification of Negative Declaration in Connection with Permitting Tank Project at Philips 66 Carson Refinery

SYNOPSIS: Communities for a Better Environment has submitted documents in which it purports to appeal the Executive Officer's approval and certification of a Negative Declaration that was done as part of the approval of SCAQMD permits for Phillips 66 to construct a new crude oil storage tank and make related changes at its Carson Refinery. This item is for the Board to consider whether to grant Communities for a Better Environment a hearing and, if necessary, to set a hearing date.

COMMITTEE: Not Applicable

RECOMMENDED ACTIONS:
1. Deny CBE's petition to set a hearing date for an appeal of the final negative declaration for the Phillips 66 Carson crude oil storage capacity project; and
2. Reject CBE's appeal of the final negative declaration for the Phillips 66 Carson crude oil storage capacity project.

Kurt R. Wiese
General Counsel

KRW:vmr

Background
On December 12, 2015, the Executive Officer—acting pursuant to Health and Safety Code section 42300(a) and SCAQMD Rule 201—approved permits for a crude-oil storage project at the Phillip 66 refinery in Carson. At the same time, the Executive Officer approved and certified a final negative declaration for the project.

The centerpiece of the Phillips 66 project is construction of a new crude-oil storage tank. The new storage tank will accept shipments of crude oil only by marine vessel. With the new storage tank, Phillips 66 will be able to accept an entire shipload of crude oil from larger marine vessels. Currently, when crude oil is delivered by larger vessels to the Carson refinery, the vessels can only offload part of the shipment because the existing tanks are too small to accept an entire load. Larger vessels currently must make two calls to offload crude oil shipments, offloading part of the shipment and then returning to offload the remainder once the earlier delivery of crude oil in the tank has been processed, and the tank has been drawn down. This aspect of the project will have an environmental benefit by reducing ship emissions.

In addition to the construction of a the crude-oil storage tank, the Phillips 66 project also involves the construction of a water-draw surge tank; increasing the permitted throughput of two smaller crude-oil storage tanks and covering them with geodesic domes; constructing new heat exchangers and a steam trap for water treatment; and installing a new electrical power substation.

Communities for a Better Environment has submitted an appeal to the Governing Board challenging the Executive Officer's approval and certification of a negative declaration for the project. In addition, CBE has submitted a petition to set a hearing date for an appeal. This action is not to consider the merits of CBE's appeal to the Governing Board or the adequacy of the CEQA document. Instead, it is for the Governing Board to decide whether to conduct an appeal proceeding, and if the Board so decides, to set a hearing date.

Legal Standard

CBE's Appeal

CBE claims that it has a right to appeal the Executive Officer's approval and certification of the negative declaration under CEQA Guidelines, 14 California Code of Regulations §15025(b)(1). See CBE's Appeal of Approval and Certification of the Final Negative Declaration for the Phillips 66 Carson Crude Storage Capacity Project, p.2, fn.2. Section 15025(b)(1) of the CEQA Guidelines states that:

"(a)…

(b) The decision-making body of a public agency shall not delegate the following functions:

(1) Reviewing and considering a final EIR or approving a Negative Declaration prior to approving a project."

According to CBE, section 15025(b)(1) requires the Governing Board to approve and certify the CEQA document for the Phillips 66 project. CBE's position is that the Executive Officer cannot approve and certify a final CEQA document for the Phillips 66 project because the Executive Officer is not the decision maker for purposes of issuing SCAQMD permits.

There are several problems with CBE's position. First, it overlooks Health and Safety Code section 42300(a) and SCAQMD Rule 201, both of which establish that the SCAQMD's Executive Officer *is* the final decision maker for purposes of issuing air district permits. Health and Safety Code section 42300(a) states that air districts may establish a permit system requiring persons to obtain permits before constructing any article that issues air contaminants, "…from the *air pollution control officer* of the district." SCAQMD Rule 201 requires that persons obtain written permits to construct, "…from the *Executive Officer*." Since the decision maker is the Executive Officer in this case, there is no right to a hearing before the Governing Board under CEQA Guideline 15025(b)(1).

Another problem with CBE's position is that that an appeal of a decision on a negative declaration can only be made "…to an agency's *elected* decision making body, if any." Public Resources Code §21151(c). The SCAQMD Governing Board is an appointed body, not an elected body. *See* Health and Safety Code §40420; 75 Ops. Cal. Atty. Gen. 103 (1992) (SCAQMD Governing Board Members hold appointive offices). Thus, CBE does not have the right to appeal the Executive Officer's decision on the Phillips 66 negative declaration to the Governing Board.

Finally CBE's position contradicts decades of SCAQMD practice. Consistent with the authorities cited above, for decades, SCAQMD Executive Officers have approved permits to construct and have approved and certified the accompanying CEQA documents. On the rare occasions where there has been an attempt to appeal a permitting or CEQA decision to the Governing Board, the Board has declined to conduct an appeal proceeding. There is no reason for the Governing Board to treat this case differently.

CBE's Petition to Set a Hearing Date

CBE has also submitted a petition to set a hearing date for its appeal of the negative declaration for the Phillips 66 project. CBE's petition states that it was submitted pursuant to SCAQMD Rule 1201. *See* CBE Petition to Set Hearing Date, p.2. However, neither Rule 1201 nor the regulation that Rule 1201 is a part of, Regulation 12, apply to this proceeding. They do not apply because this proceeding challenges a CEQA document; it does not seek a hearing on a permit application. Regulation 12 and Rule 1201 apply to proceedings on permit applications. *See* Health and Safety Code §40509; SCAQMD Rule 1201 ("…any person may petition the SCAQMD Governing Board to hold a hearing on a permit application.") CBE has not challenged the Phillips 66 permits.

Instead, CBE has challenged the CEQA document for the Phillips 66 project. Regulation 12 and Rule 1201 do not apply to this proceeding.

Even if Regulation 12 and Rule 1201 did apply to this proceeding, CBE's petition would be untimely. Rule 1201 provides for a public hearing on a permit "application." In this case there are no longer any applications for the Phillips 66 project because the permits have all already been issued. Even if the Board decides that Regulation 12 applies to this proceeding, it should deny CBE's petition as untimely.

Proposal

1. Deny CBE's petition to set a hearing date for an appeal of the final negative declaration for the Phillips 66 Carson crude oil storage capacity project; and
2. Reject CBE's appeal of the final negative declaration for the Phillips 66 Carson crude oil storage capacity project.

Resource Impacts

None

Attachments

1. CBE's Appeal of SCAQMD's Final Negative Declaration for Phillips 66 Carson Tank Project
2. Exhibits to Appeal of Final Negative Declaration for Phillips 66 Carson Tank Project
3. CBE's Petition to Set Hearing Date for Appeal
4. Phillips 66's Opposition to Appeal
5. CBE's Notice of Intent to File CEQA Petition

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COMMUNITIES FOR A BETTER ENVIRONMENT

BEFORE THE GOVERNING BOARD OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

In the Matter of **The South Coast Air Quality Management District's December 12, 2014 Approval and Certification of the Final Negative Declaration for the Phillips 66 Carson Crude Oil Storage Capacity Project**	**APPEAL OF APPROVAL AND CERTIFICATION OF THE FINAL NEGATVIE DECLARATION FOR THE PHILLIPS 66 CARSON CRUDE OIL STORAGE CAPACITY PROJECT**

I. INTRODUCTION

This appeal challenges the South Coast Air Quality Management District's ("District") failure to comply with the California Environmental Quality Act ("CEQA"), Public Resources Code § 21000 *et. seq.*, 14 Cal.Code Regs § 15000 *et. seq*. in its approval and certification of the Final Negative Declaration for the Phillips 66 Carson Crude Oil Storage Capacity Project ("Project") on December 12, 2014. The District's approval of a Final Negative Declaration for the Project fails to comply with CEQA because there is substantial evidence in the administrative record of a fair argument that the Project may have a significant, adverse effect

on the environment and human health; thereby requiring preparation of an environmental impact report ("EIR").[1]

Because the District Governing Board is the governing body of the agency, the Governing Board has a non-delegable duty under CEQA to certify a Final Negative Declaration.[2] The Governing Board has no published, formal procedures for evaluating and deciding on CEQA documents. Additionally, the Final Negative Declaration approved and certified on December 12, 2014 appears to have been considered, approved and certified solely by District staff. This process makes the District's decision to approve and certify the Final Negative Declaration unclear, and renders the approval and certification procedurally deficient.

Moreover, because the District is also the highest-elected decision-making body for the agency, CEQA requires that the Governing Board provide for an appeal of the District staff's CEQA determination.[3] Accordingly, Communities for a Better Environment ("CBE") hereby requests that the Governing Board deny certification, withdraw and re-consider the District's approval of the Final Negative Declaration for the Project in accordance with its non-delegable authority under CEQA Guidelines, §15025(b)(1), or, in the alternative, appeals the District's approval and certification of the same Final Negative Declaration pursuant to the same CEQA Guidelines section.

II. FACTUAL BACKGROUND

CBE, and its members, particularly those who reside in and around refineries located in the South Coast Air District, have long expressed their concern with refinery operations, their emissions, and potential hazards including flares and accidents that result from refinery operations. Since at least the year 2013, CBE, CBE members and allies have expressed serious concerns with industry trends to increase the transport, storage and refining of dangerous crudes from new North American, domestic and Canadian sources. These concerns have been noted in

[1] *See* CEQA Guidelines, 14 Cal. Code Regs § 15064 (f)(1) ("if a lead agency is presented with a fair argument that a project may have a significant effect on the environment, the lead agency *shall* prepare an EIR even though it may also be presented with other substantial evidence that the project will not have a significant effect." (emphasis added).

[2] CEQA Guidelines, §15025(b)(1).

[3] Cal. Health and Safety Code § 40420; CEQA Guidelines §15025(b)(1) (requiring the decision-making body to approve a negative declaration prior to approving a project); *c.f. Id.* § 15074(f) (providing for appeal of a decision by a local lead agency to adopt a Negative Declaration to the agency's highest elected decision-making body).

correspondence to the District attached hereto at Exhibit A, and have formed the basis for comments submitted to District Staff in relation to project proposals and permit approval processes including the environmental review process for the Phillips 66 Carson Project, as well as other Phillips 66 project proposals throughout the state.

On or about September 6, 2013, the District issued for public review and comment a Draft Initial Study and Negative Declaration for the Project pursuant to Public Resources Code section 21092.

The Project description contained in the Draft Negative Declaration described the project as one involving the following components: (1) installation of one new 615,000 bbl nominal capacity crude oil storage tank, which is identified as tank 2640, and which would be accompanied by a geodesic dome for fugitive emission controls; (2) increasing the permitted throughput limit of two 320,000 bbl nominal capacity existing external floating roof crude oil storage tanks, Tanks 510 and 511, from 4.562 million bbl per year to 18 million bbl per year for each tank and installing geodesic domes on each of those tanks to control fugitive emissions; (3) installation of two new, 2,100 gallons per minute (gpm) crude oil feed/transfer pumps to transfer crude oil into and out of the new tank (Tank 2640); (4) installing of one new, 14,000 bbl nominal capacity water draw surge tank (Tank 2643), including geodesic dome, pumps, and pipelines; (5) installation of three new heat exchangers and one steam trap to assist in water treatment; (6) installation of tie-ins to the manifold of the Pier "T" crude oil delivery pipeline from Berth 121; and (7) installation of one new electrical power substation.

The Draft Negative Declaration and Notice of Intent concluded that the Project components described above would not have a significant impact on the environment and therefore, no EIR would be required for the Project.

SCAQMD invited comments on the Draft Negative Declaration for a period of 30 days, and closed the comment period on October 9, 2013.

On October 9, 2013, prior to the close of the comment period, CBE submitted comments, based on, *inter alia*, the following flaws in the Draft Negative Declaration's analyses:

1. CBE asserted in comments that the Project description was piecemealed from a larger,

company-wide project to front-end the transport, storage and refining of "advantaged" or "cost advantaged" Western Canadian tar sands, and North Dakota Bakken crudes. In support, CBE included Phillips 66 corporate and market data indicating that Phillips 66 considers "advantaged" or "cost advantaged" crudes to be comprised of Western Canadian tar sands and North Dakota Bakken crudes, and that based on a variety of publicly available data, the company intended to increase shipments of such crudes specifically to its Los Angeles refinery, including the Carson facility,

2. CBE also identified project specifications further indicating that the Project was designed to facilitate the Los Angeles Refinery's receipt, storage and processing of "advantaged" crudes;
3. CBE pointed to substantial evidence, including reports, data and other scientific information showing why such new crude would cause significant environmental impacts including but not limited to, increased air emissions and risks of hazards as a result of sulfur corrosion from higher-sulfur content crudes; and
4. CBE highlighted the cumulatively considerable, existing burden in the area surrounding the project, specifically in the City of Carson, and in Wilmington.

In January 2014 CBE members and staff met with District staff and members of the Governing Board about another project, and asked for updates and information about the Phillips 66 Carson Project. CBE staff and members specifically asked the District to consider the health and hazards impacts that could result from increasing the amount of tar sands and Bakken crudes blended in Los Angeles refinery crude slates, noting the Phillips 66 Los Angeles refinery in particular. Between February and November 2014 CBE staff and members made additional, repeated requests for information regarding the Project from District staff and some members of the Governing Board, both individually and during public comment at regular Governing Board meetings, and for information specifically regarding the air emissions and health impacts of transporting, receiving and refining tar sands and Bakken crudes.

Since October 2013, CBE and other environmental health and justice organizations have submitted extensive comments on other projects proposed by Phillips 66 in Santa Maria, San

Luis Obispo County, and in Rodeo, Contra Costa County, as well as other non-Phillips 66 projects to transport, store and refine tar sands and Bakken crudes. In these comments, CBE, and other allied environmental health and justice organizations, advocates and technical experts, have exposed new information regarding the potential for highly dangerous fugitive and operation emissions from both process and storage equipment, and the increased risks of potentially catastrophic hazards associated with such crudes.

A relevant selection of these comments and other relevant documents are attached hereto in Exhibits.

On December 12, 2014, after over a year of reviewing and responding comments District staff published its Notice of Determination and Project approval, finalizing and certifying the same Draft Negative Declaration released on September 6, 2013 for comment, as the Final Negative Declaration for the Project.

On December 22, 2014, CBE staff received by mail, the District's notice of determination, project approval and approval of the final negative declaration. The Notice and Project approval documents indicate that the Final Negative Declaration was certified on the same day the District issued its Notice of Determination: December 12, 2014.

Despite the names of all Governing Board members being listed on the second page of the final negative declaration, the Governing Board has not approved the project and the final negative declaration for the Project is not reflected in any publicly available SCAQMD Board meeting agendas or minutes documents.[4] Thus, while the notice received by CBE indicates that the final negative declaration was certified, there is nothing contained on the record to indicate that it was considered by the Governing Board. In fact, the list of all Governing Board members affirmatively misleads the public that the Governing Board has reviewed the document, when it

[4] The only reference to the Governing Board's consideration of the Draft or Final Negative Declarations for the Project that appear to be publicly available, is found in the Governing Board Agenda packet for the December 5, 2014 regular Governing Board meeting. That agenda, and "Attachment C" to the agenda, are attached hereto at Exhibit Q. The attachment indicates only that the Governing Board reviewed a summary of the active projects for which the District is the lead agency wherein the Draft Negative Declaration for the Project was included. District's Staff's description of that status of the Draft Negative Declaration at the time of the Board meeting provides only that the Staff's consultant "is making edits to the responses and finalizing the Draft ND." (*See* Final Negative Declaration, Appendix F: Phillips 66 Los Angeles Refinery – Carson Plant Crude Oil Storage Capacity Project.)

has not.

In response to the comments submitted by CBE on October 9, 2013, District staff claim the following, *inter alia*: (1) CBE's characterization of project specifications indicating that the Project may be designed to facilitate the increased transport, storage and processing of tar sands or Bakken crudes is mistaken as CBE misunderstands the refinery's operations, and the purpose of the Project is merely to increase efficiency and capacity to offload and store larger crude tank deliveries made by marine vessel to the Los Angles Refinery; (2) that CBE's characterization of any increased emissions and/or significant environmental impacts including cumulative impacts is similarly misguided as CBE misunderstands the purpose of the Project; and (3) that the Phillips 66 Los Angeles Refinery has already been receiving, storing and processing Canadian crudes including tar sands crudes and tar sands crude blends since 2002, and the District has included in its response to Comments, new information to support this claim, which was not previously released or made publicly available at any time during the comment period.[5]

The District's revealing of new information at the same time in which its staff has rubber stamped a cursory environmental review document, itself requires immediate withdrawal of the District's approval of the Final Negative Declaration for the Project, and requires reconsideration of the appropriateness of a negative declaration under the circumstances. In particular, the Final Negative Declaration fails to analyze the current and post-project crude quality baseline, as required by CEQA.

In public statements made by Phillips 66 representatives and through the environmental review process for its two additional projects proposed in San Luis Obispo and Contra Costa County, Phillips 66 continues to expose additional information regarding its plans, and its execution of its plans to transport, process and refine tar sands and Bakken crudes at all of the company's California refineries. For example, in a transcript from an investor conference call from the third quarter of 2014, Phillips 66 Chairman and CEO is quoted stating that the company will "get **to 100% advantaged crude in the next year"** or so as we continue to move these

[5] *See generally*, Final Negative Declaration, Appendix F: Phillips 66 Los Angeles Refinery – Carson Plant Crude Oil Storage Capacity Project; and at F-46.

projects forward around infrastructure.[6] Such statements and information find further support in Project applications and related application documents including correspondence between District staff and Phillips 66 representatives, attached hereto in exhibits. All of these facts require the District to immediately withdraw the its approval of the Final Negative Declaration, as the document still fails to account for the impacts that stem from Phillips 66's change in crude slate, as further described below.

On January 2, 2014 CBE sent a letter to SCAQMD staff requesting withdrawal of its approval of the final negative declaration as a result of notice issues, some of the issues raised above, in comments, and in the District's responses to comments. After hearing no response from District staff, CBE hereby files this appeal to the Governing Board.

III. GROUNDS FOR APPEAL

CBE appeals the District's approval of the Project's Final Negative Declaration for two reasons. First, District staff does not have authority under CEQA to approve and certify a Final Negative Declaration on its own. Approving final negative declarations is a non-delegable duty of the District Governing Board.[7] Second, the District violated CEQA's mandate that an EIR be prepared when, as in this case, commenters have met the "fair argument" legal standard by presenting substantial evidence that the Project may cause significant adverse health and environmental impacts and when new, material information regarding the project has become available since the close of the comment period.[8] As such, and for the additional reasons briefly herein, and supported by the attached Exhibits we appeal the District's December 12, 2014 final determination approving and certifying the Phillips 66 Carson Project Final Negative Declaration.

[6] Q3 2014 Transcript at p. 14, attached hereto in exhibits (emphasis added).
[7] CEQA Guidelines, §15025(b)(1).
[8] CEQA Guidelines §15162.

THE DISTRICT MUST PREPARE AN EIR FOR THIS PROJECT

1. CEQA provides a low threshold for when an agency must prepare an EIR.

CEQA must be interpreted to "afford the fullest possible protection to the environment within the reasonable scope of the statutory language."[9] CEQA requires a lead agency to assess a project's impacts on the environment.[10] Preparation of an EIR is required whenever substantial evidence in the record supports a *fair argument* that significant impacts may occur.[11] The "fair argument" standard creates a low threshold for requiring preparation of an EIR.[12]

Because issuing a Negative Declaration has a terminal effect on the environmental review process, CEQA provides that a lead agency may only issue a Negative Declaration instead of a full EIR if there is "no substantial evidence, in light of the whole record before the lead agency, that the project may have a significant effect on the environment."[13] An EIR is necessary to resolve "uncertainty created by conflicting assertions" and to "substitute some degree of factual certainty for tentative opinion and speculation."[14] An agency's decision not to require an EIR can be upheld only when there is *no credible evidence* to the contrary.[15]

2. The District's decision to approve and certify the Negative Declaration ignores potentially significant impacts from allowing for the increased transport, storage and processing of dangerous domestic and Canadian derived crudes--which the District admits for the first time in responses to comments have been processed in the past at the Lost Angeles Refinery.

CBE cited throughout its comments evidence that the project is likely to have significant impacts on the environment, especially given the fact that the refinery intends to increase the

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[9] *Communities for a Better Environment v. Calif. Resources Agency* (2002) 103 Cal. App. 4th 98, 110.
[10] Pub. Res. Code §§ 21002.1(a), 21061.
[11] *Ocean View Estates Homeowners Ass'n v. Montecito Water Dist.* (2004) 116 Cal.App.4th 396, 399; Pub. Res. Code § 21080(d); CEQA Guidelines § 15384(a) ("'Substantial evidence' as used in these guidelines means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached.").
[12] *Ocean View Estates*, 116 Cal.App.4th at 399; *Citizens Action to Serve Students v. Thornley* (1990) 222 Cal.App.3d 748, 754.
[13] Pub. Res. Code § 21080(c)(1).
[14] *No Oil, Inc. v. City of Los Angeles* (1975) 13 Cal.3d 68, 77, quoting *County of Inyo v. Yorty* (3d Dist. 1973) 32 Cal.App.3d 795, 814.
[15] *Sierra Club v. County of Sonoma* (1992) 6 Cal.App.4th 1307, 1318 (emphasis added).

amount of dangerous and dirty domestic crudes, and that this Project will necessarily involve offloading, storage and refining of such crudes at the Los Angeles Refinery. The District's responses to comments concerning the Phillips 66 Carson Project expose the agency's cavalier approach to the serious human health and environmental concerns raised by commenters to that project, as well as other, similar projects. In its responses, the District--for the first time--admits the refinery has been using relatively low percentages of Canadian crude, with Table F-1 showing overall Canadian crude at 9.5% over the years, with the highest percent at 21% in 2013[16] so the refinery has the potential to greatly increase use of this crude oil source.[17] The District states that Phillips 66 not only plans to bring down heavy tar sands and dangerous Bakken crudes in the foreseeable future, but it also concedes that the refinery has been processing the same crude types, without disclosure to the public for a significant amount of time.[18]

Publicly exposing this fact in the same act in which it rubber stamps its minimal review of the Project's potential impacts presents a clear dereliction of the agency's duty to protect the environment and to minimize air emissions in the South Coast.[19] Furthermore, because the District revealed this critical new information for the first time in its responses to comments, it must analyze the resulting impacts.[20] The impacts resulting from the increased transport, storage, and refining of dirty and dangerous crudes in Phillips 66's crude slate must be analyzed in an EIR.

The new information contained in the District's responses to comments also requires

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[16] *See e.g.,* Notice of Determination – Final Negative Declaration Phillips 66, Los Angeles Refinery – Carson Plant Crude Oil Storage Capacity Project – SCH No. 2013091029, at Appendix F, Response 2-9, F-46.
[17] ND Appendix F, p. F-46,
[18] *See e.g., Id.* at F-42.
[19] *See City of Redlands v. County of San Bernardino* (2002) 96 Cal.App.4th 398, 405 (holding that an (EIR) must be prepared under CEQA whenever substantial evidence in the record supports a "fair argument that a proposed project will have a significant effect on the environment" (citations omitted).); *see also*, CEQA Guidelines §15384, and 42 U.S.C. § 7401(b)(1)-(3), (c), *supra*; *and see* Cal. Health and Safety Code § 40001(b) (District rules and regulations may, and at the request of the state board provide for the prevention and abatement of air pollution episodes which, at intervals, cause discomfort or health risks to, or damage to the property of, a significant number of persons or class of persons.).
[20] Pub. Res. Code § 15162(a)(3) (requiring an agency to prepare an EIR where new information of substantial importance shows the project will have significant impacts not discussed in a previous Negative Declaration or more severe impacts than previously discussed).

withdrawal of approval and reconsideration of the Final Negative Declaration for the Project, and requires preparation of an EIR. The District's responses to comments, specifically conceding that Phillips 66 already processes and refines Canadian crude blends including tar sands crudes and as well as domestic Bakken crudes substantiate a fair argument that the Project may cause significant environmental impacts. Moreover, this new information, coupled with Phillips 66's more recent Corporate statements cited above further indicate that there are substantial changes to the circumstances under which the Project is being undertaken, requiring a new environmental review process.[21]

2. The District cannot ignore substantial evidence weighing in favor of preparing an EIR.

Phillips 66's own stated project objectives substantiate at least a fair argument that the Project may cause significant adverse environmental impacts that were not addressed by the District in the environmental review process for the Final Negative Declaration. For example, the District has failed to analyze the potential significant increase in baseline sulfur content in the refinery due to a change in the *average* crude oil slate toward substantially increased Canadian tar sands crude oil, facilitated by the new and expanded storage tanks.[22] The Final Negative Declaration assumes that the project's increased tank storage volume and throughput is only for the purpose of offloading from ships faster and to optimize blending.[23] The District asserts that this is unrelated to and cannot cause any downstream changes in the refinery, and it appears that the District's exposure of the fact that the refinery already processes both Canadian and domestic Bakken crudes is included in responses to comments in order to support this claim.[24]

The District's conclusion, however, is incorrect, and fails to adequately address CBE's comments concerning the impacts resulting from a shift in the quality of crude received and

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[21] *See* CEQA Guidelines § 15162 (requiring preparation of subsequent environmental review documents when there are changes in circumstances surrounding a project proposal, notwithstanding approval or certification of the initial environmental review document.

[22] For the purpose of this appeal, this point is made, notwithstanding the District's claim that there will be no increased to the Refinery's throughput levels.

[23] *See* Final Negative Declaration at pp. 1-3 and 1-5 to 1-6.

[24] Final Negative Declaration Appendix F, at pp. F-42.

stored at the Carson facility.

The record shows that both the District and Phillips 66 are clear that the Project storage tanks will be used for the express purpose of bringing in larger volumes of "advantaged" crude oil from Canada and the Bakken shale, implying a change in the overall crude slate quality by volume, notwithstanding the fact that the Refinery may process some inherently lower volumes of Canadian and Bakken crudes currently and may have in the past. Phillips 66's 2012 Summary Annual Report included in CBE's comments on the Draft Negative Declaration provides a map showing the company's plans to bring increased shipments of what it calls "advantaged crudes" to the LA Refinery, specifically from Canada and from the North Dakota Bakken fields. CBE's comments also quote Phillips 66 representatives stating that the company specifically intends to increase shipments of tar sands and Bakken crudes as "advantaged crudes." There is also more in our comments on the draft ND showing where the company stated its intention to bring these "advantaged crudes" to California. Phillip's Application for Tank 2640, and related documents attached hereto in Exhibits also include emails from the District asking Phillips 66 for more information regarding the new tanks project. These emails provide further documentation of the company's intent to use the Carson facility tanks to receive and store tar sands crudes for use in the refinery's operations.

> "As I mentioned on the phone, **I am requesting additional information in support of your crude tanks applications**. Please provide the following information: • Details on the speciation of crude oil (the toxics speciation you used in your TANKS calculations), as well as the origin of this speciation and why you feel it is the worst-case scenario for toxics." (Janice West, AQMD, January 10, 2013) . . . (emphasis added).
>
> "In the attached table, there are columns for SJV[25] crude, "crude oils", Cal crude, and crude hybrid. **What is the origin of "crude oils"?** (Janice West, AQMD, Sept. 3, 2013) . . . (emphasis added).
>
> "**Sorry, I meant *geographic* origin** or other identifier, (similar to California or San Joaquin Valley or Canada), just to identify that column as different and not an average of the others). . . . (Janice West, AQMD, Sept. 3, 2013) . . . (emphasis added).

[25] SJV is San Joaquin Valley – a California crude the company has used historically.

"**Our Crude buyer calls it AWB crude.**[26] **It is from Canada.**" (John W. Matthews, Phillips 66, Sept. 3, 2013) (emphasis added).[27]

Phillips 66's more recent corporate statements also re-iterate the purpose of the tanks. In Phillips 66's 2014 "fact book" description of its "midstream" West Coast operations, the company states the following: *"We are adding additional tankage at our Los Angeles Refinery to increase access to advantaged waterborne crudes."* This statement directly refutes the District's responses to comments and their reliance on the claim that CBE "incorrectly assumes that increasing crude oil storage capacity will result in a change in the quality of crude oil blend that is processed at the refinery." [28]

In response to comments the District states that "[w]hile SCAQMD staff does not dispute that crude oils have varying chemical properties and characteristics, including sulfur content, the commenter makes an unsubstantiated assumption that the proposed project will cause the type of crude oil delivered to the LARC to change, when in actuality, the proposed project would not affect the ability, nor would it have any effect on the types of crude oil feedstocks that can and will be received at the LARC."[29] Taken together these statements and correspondence point to the presence of substantial evidence that the company specifically intends to bring in a higher volume of advantaged crude oils from Canada, and that the storage tanks in the Project are indeed for the express purpose of facilitating this effort.

The AWB Canadian and other Candian tar sands crudes described above in the Application documents, moreover, are heavy, with extremely high sulfur content. At 4%, these crudes rank much higher in the presence of sulfur as compared to other crude oils that are also considered to be high in sulfur content.[30] For example, when compared to the average California crude oils historically used in the refinery, including San Joaquin Valley and other crudes, the

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[26] AWB stands for Access Western Blend, it is a heavy, highly corrosive and high sulfur diluted bitumen, or tar sands blend. *See* crude monitor description of properties, relative index and data available at: http://www.crudemonitor.ca/crude.php?acr=AWB

[27] *See* attached exhibits.

[28] *See* Appendix F: Phillips 66 Los Angeles Refinery – Carson Plant Crude Oil Storage Capacity Project, throughout.)

[29] *See Id.*, at F-62.

[30] http://www.crudemonitor.ca/crude.php?acr=AWB; *see also* CBE's Technical comment to the Draft Negative Declaration at p. 13.

California Energy Commission found the following:

> Kern County: In 2004, oil from Kern County accounted for 77 percent of California's total onshore production and over **69 percent of the state's total oil production**. Approximately 58 percent of the crude oil has an API of 18 degrees or less. The Kern River oil field, located in the eastern San Joaquin Valley, accounts for approximately 24 percent of Kern County oil. Kern River oil is characteristically heavy and sour with an API of 13.4 degrees and a sulfur content of 1.2 percent.
>
> Los Angeles Basin: The Los Angeles Basin is a sedimentary plain extending from central Los Angeles south through the Long Beach area. The two largest fields by area in this region are the Wilmington and the Huntington Beach fields with average APIs of 17.1 and 19.4 degrees, and average sulfur contents of 1.7 and 2.0 percent, respectively. [31]

Yet, while CBE's comments to the Draft Negative Declaration identified the need for baseline crude slate data including sulfur content at the refinery as necessary to determine the potential overall increase in sulfur content due to the Project, the District failed to do so.

CBE's comments point out that "The ND should have identified baseline crude slates and sulfur content data at the Phillips 66 Los Angeles refinery complex, in addition to the percent sulfur of the unconventional crudes which can potentially be processed due to the Project changes discussed, and volumes of the baselines and crude changes."[32] The Final Negative Declaration, however, states that "The Draft ND does not include a baseline or future changes in crude oil type refined by the LARC because the proposed project will not change, enlarge, or otherwise impact the types and/or quantities of crude oil that LARC currently and will continue to refine." [33] The Final Negative Declaration bases this assertion on its claim that the distillation unit or "crude" unit limits the refinery operation, and without increasing the crude oil there, nothing downstream could change.[34] This statement cannot be true, because crude oil volume limits at the distillation unit do not limit the percent of sulfur in the crude. Downstream of the

[31] California Crude Oil Production and Imports, California Energy Commission, APRIL 2006, CEC-600-2006-006, available at: http://www.energy.ca.gov/2006publications/CEC-600-2006-006/CEC-600-2006-006.PDF
[32] CBE JMay Draft Negative Declaration Comments at p. 14.
[33] Final ND at p. F-62
[34] *See Id.*

distillation unit inside the refinery, it is the capacity of the sulfur processing units such as the hydrotreaters and sulfur recovery units that limit how much sulfur can be processed.[35]

The Final Negative Declaration fails to provide any baseline for sulfur processing such as the hydrotreater and sulfur recovery units and instead, it merely provides the range of sulfur that can be processed -- 1 to 3%. But, within the refinery's design range, a baseline can fluctuate over years, and the introduction of extremely high sulfur Canadian tar sands crude oil can increase that overall sulfur processing level, which can result in large increases in the amount of extremely toxic and corrosive sulfur compounds processed in the refinery. Thus, the Final Negative Declaration failed entirely to evaluate the potential for a significant increase of sulfur, as compared to the baseline, due to the Project.

The Final Negative Declaration notes that because there is a small range of sulfur that the refinery is designed to process, even if very high sulfur crude is introduced, it can will be mixed with lower sulfur crude so that the average level of sulfur goes down to the designed range that the refinery can process. The District states:

> "The commenter's opinions do not take into account the processing of a crude oil blend, and thus do not reflect the operations at the Refinery. At p. F-40
>
> "For instance, if the crude oil to be purchased by the LARC has a sulfur content higher than what can be processed by the equipment, LARC must blend it with a crude oil that has a lower sulfur content, so that the sulfur content of the overall blend falls within the proper specifications. The blend of crude oil that is processed at the LARC contains sulfur between the narrow range of one to three percent based on the processing constraints of the Refinery equipment. In the event that there is no low sulfur crude oil available on-site or for purchase to blend with the higher sulfur content crude oil, the LARC will not purchase the high sulfur content crude oil because it cannot be processed without blending. This process of purchasing and blending crude oils has been in practice at LARC for many years and

[35] *See generally*, Appendix 3 to Chevron Modernization Project, at Exhibit (X), available at: http://chevronmodernization.com/wp-content/uploads/2014/03/Appendix_3_Overview.pdf and the Norwegian University of Science and Technology, available at: http://www.diva-portal.org/smash/get/diva2:649648/FULLTEXT01.pdf and in attached exhibits.

> will not change as a result of the proposed project. For these reasons, the proposed project will not change the types of crude oil processed by the LARC and will not require any modifications to any crude oil refining equipment at the LARC."[36]

Again, the District mischaracterizes CBE's analysis. CBE did account for the range of sulfur in the overall blend processed at the refinery and the District response fails to include any information relevant to establishing an actual sulfur baseline in the refinery. As described above and in more detail in CBE's comments to the Draft Negative Declaration, the question of sulfur baseline is not about whether the refinery can stay within its designed general range of the percent sulfur in individual crude oils processed, it is total baseline that the refinery *has* been operating at over the last few years, and whether the Project will cause an increase in the *total mass* of sulfur, and the overall refinery *average* sulfur percent in the crude oil, and whether the Project will increase those values within the design range. The design range at the refinery is not the basis for a CEQA evaluation, the actual conditions are.[37]

The potential for a significantly increased sulfur percent in the crude oil processed by the refinery due to the Project also may imply higher volumes of hazardous hydrogen sulfide ("H2S") in the refinery, increased danger of corrosion, and increased accident risks, as discussed in CBE's comments on the Draft Negative Declaration. These concerns and potential significant impacts were dismissed by the District on the basis that there was no change to the *types* of crude oils processed as described above, but since the information above shows that there is substantial information providing a fair argument that the refinery plans for the crude oil tanks to facilitate the introduction of "advantaged crudes" including Canadian tar sands crude oils, the Final Negative Declaration's conclusion is incorrect, and it cannot avoid the need for providing a full review and analysis of the potential for increased hazardous sulfur compounds in the refinery that are hazardous to human health and increase accident risk.

H2S is present in sour crude oil, and is also formed in the refinery from the presence of sulfur in the crude oil. More sulfur in the crude oil could mean more H2S in the refinery. While,

[36] *See* Final Negative Declaration at p. F-44.
[37] *Communities For A Better Environment v. South Coast Air Quality Management District,* 48 Cal.4th 310, 324.

there are also many other acutely hazardous and corrosive sulfur compounds that are formed because of this, H2S remains a large source, and provides another example of what must be evaluated in accounting for the potential environmental impacts of a change in crude slate at the Los Angeles refinery.

CBE discussed the corrosive and accident hazards from H2S in CBE's Draft Negative Declaration comments, and there is a broad range of materials on this subject available. The District is well aware of this but refused to address issues related to the increase in H2S because it erroneously concluded there is no nexus between the crude oil tanks and the high sulfur crude plans of the company.

A study by the Norwegian University of Science and Technology explains in detail, the history of H2S chemistry in oil refineries.[38] The report summarizes many points about hazardous sulfur chemistry due to sour crude oil as follows:

> "The sulfur compounds in crude oils and natural gas generally exist in the form of free sulfur, hydrogen sulfide, thiols, sulfides, disulfides, and thiophenes. These compounds can cause considerable technical, environmental, economic, and safety challenges in all segments of petroleum industry, from upstream, through midstream to downstream. . . .
>
> The major corrosion problems in oil and gas processing facilities are not caused by hydrocarbons but by various inorganic compounds, such as water, hydrogen sulfide, hydrofluoric acid, and caustic. There are two essential sources of these conglomerates: feed-stock contaminants and process chemicals, including solvents, neutralizers, and catalysts (Nenry & Scott, 1994)."[39]

The 2014 EIR for the Chevron Richmond Refinery Modernization Project also describes this hydrotreating sulfur removal process that is present in refineries, and describes how these impurities can interfere with refinery processes. For example, Section 3.2.2 of Appendix 3 to that document states:[40]

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[38] Production and processing of sour crude and natural gas - challenges due to increasing stringent regulations, Norwegian University of Science and Technology, 2013, http://www.diva-portal.org/smash/get/diva2:649648/FULLTEXT01.pdf

[39] *Id.*

[40] Chevron Refinery Modernization Project EIR, March 2014, Appendix 3, Overview of Oil Refining Process, Chevron Modernization Project, 2013, http://chevronmodernization.com/wp-

"Another important natural characteristic of crude oil is that different types of crude oil have differing amounts of sulfur content. Sulfur occurs naturally in crude oil, but sulfur content is restricted by federal and State air quality laws in refined products (e.g., there are standards limiting the amount of sulfur that can be present in refined products like gasoline). To meet these regulatory restrictions on sulfur content in refined products, sulfur is removed from the various fractions of crude oil during the refining process. [emphasis added] …

When an oil has less sulfur, it is referred to as being "sweet." Crudes with more sulfur are referred to as being "sour." Although there is no regulatory threshold of sulfur content for dividing sweet crude oils from sour crude oils, oils with less than 0.5% sulfur content are generally referred to as "sweet." …

Most sulfur present in crude oil is bonded within hydrocarbon molecules, although some is present as hydrogen sulfide (H2S) gas . This is different from "elemental" or pure sulfur (a yellow crystalline substance when at room temperature), which is a usable product. During the refining process, the sulfur atom is removed from the hydrocarbon molecule. **This process is called "hydrotreating"** because it includes the use of hydrogen. The hydrocarbon fractions are combined with hydrogen in the presence of a catalyst and elevated temperatures and pressures. The catalyst, temperature, and pressure separate the sulfur from the hydrocarbon molecule and the sulfur combines with the available hydrogen to produce a gas called hydrogen sulfide (H2S). This hydrogen sulfide gas is then treated, as explained below, to create "elemental" sulfur, which is sold as a product by Chevron. The Modernization Project includes several components to allow Chevron to remove more sulfur from the Facility's feedstocks and thereby refine higher sulfur crude oil and gas oil in the future."

Section 3.4.2 of the same document further provides:

"Hydrocarbons separated in the crude unit distillation process and SDA unit contain naturally occurring sulfur and other natural impurities such as nitrogen and metals. One of the key later steps in the refinery process involves chemical reaction processes that include a "catalyst" – a material that promotes or speeds up chemical reactions to produce either a finished product or another interim material to be processed further, such as in the Cracking step. These impurities can interfere with the cracking processes.

content/uploads/2014/03/Appendix_3_Overview.pdf

An example of the kinds of accidents and releases that can occur in sulfur processing units was listed in a Contra Costa County Northern California website publication, in a summary of refinery accidents. The H2S release described there occurred during a hydrotreater upset:

> "An upset occurred in the straight run hydrotreater unit in the light oil processing area. Subsequently, fires occurred in the vacuum flasher heater furnace and crude unit heater furnace. Hydrocarbons, H2S, and smoke released offsite. Level 3 under CWS, sirens activated."[41]

An added example of the range of potential impacts from the increased presence of H2S is contained in the Agency for Toxic Substance and Disease Registry, (ATSDR) H2S Fact Sheet. That fact sheet states that:

> *"Just a few breaths of air containing high levels of hydrogen sulfide gas can cause death. Lower, longer-term exposure can cause eye irritation, headache, and fatigue."*[42]

While CBE does not dispute that Phillips 66 can buy a range of crude oils, there is also no disputing that the company explicitly plans to use the Project tanks to facilitate a significant increase in receiving, storing and processing "advantaged crude" oils, and specifically tar sands and Bakken crudes, as has been made clear repeatedly by its own representatives. It is also well known and documented on the record including the exhibits attached hereto, that heavy, high sulfur Canadian crude oils and Bakken crudes carry serious environmental and human health implications.[43] In addition to the procedural and other substantive flaws contained in the District's approval and certification of the Final Negative Declaration for the Project, the Final Negative Declaration fails to evaluate the baseline and fails to account for increased sulfur processing in the refinery due to the potential major increase in high sulfur crude oil. The Final

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[41] Contra Costa County – including Equilon refinery hydtrotreater accident, July 18, 2001, http://cchealth.org/hazmat/accident-history.php

[42] ATSDR, 2006, Division of Toxicology and Environmental Medicine ToxFAQs, http://www.atsdr.cdc.gov/tfacts114.pdf

[43] These two crudes are those which have been identified by Phillips 66 as explicitly included in the company's current definition of "advantaged" or "cost advantaged" crudes, as they are relatively less expensive than other crudes and can greatly increase Phillips 66's profit margin. While these two crude types may cause distinct impacts, both indisputably cause significant, detrimental impacts as a result of their chemical composition and blend with diluents as further described in the attached exhibits including the expert reports from Dr. Phyllis Fox, submitted for the purpose of analyzing impacts from similar projects elsewhere in the state. *See* Exhibit U, included in attached Exhibits.

Negative Declaration thereby ignores the critical need to evaluate the potential significant impacts due to increased hazardous sulfur materials in the refinery and dismisses the possibility that the refinery's current baseline sulfur content could increase. By this omission the Final Negative Declaration omits a necessary analysis of substantial evidence supporting a fair argument that the Project has the potential to cause significant environmental impacts, due to the potential to greatly increase Canadian tar sands crude oil as described above, and as further described in CBE's comments to the Draft Negative declaration. The District also appears to assume that because N. Dakota Bakken crude oil has been used at the refinery previously it was not necessary to evaluate environmental impacts caused by significant increases in the use Bakken crude oil that will be facilitated by the Project. As previously discussed, Phillips 66 specifically stated that the new tankage as for the purpose of bringing in "advantaged crude" oils. Phillips identified both Canadian crude and N. Dakota Bakken crude oil as the two advantaged crudes it is seeking to bring to the refinery. CBE provided information in the comments on the Draft ND on the problems of Bakken crude oils, which are more volatile and can increase accident risk in refineries.

Furthermore, the Department of Transportation has published safety alerts for all forms of transport of Bakken crude oil (not just rail), so the ship transport proposed in the Project is also vulnerable to this increased danger due to the volatility of this crude oil.[44] Baselines of the refinery crude oil in general are missing and an evaluation of the impacts of the increases in Bakken crude oil in transportation, and in the refinery are also missing, because the District stated there is no nexus between the company's advantaged crude plans and the new tanks. Phillips 66 statements, however, clearly warrant a full evaluation of these potential impacts.

Other characteristics of the "advantaged" crudes, or specifically the AWB crudes identified by Phillips 66 in correspondence to the Distrcit, such as its vapor pressure or flammability, may also differ in significant ways from the crudes processed in the Los Angeles Refinery's current crude slate. These other constituents and properties are not a function of the

[44] The U.S. Department of Transportation Pipeline and Hazardous Material Safety Administration, January 2, 2014, http://phmsa.dot.gov/pv_obj_cache/pv_obj_id_111F295A99DD05D9B698AE8968F7C1742DC70000/filename/1_2_14%20Rail_Safety_Alert.pdf.

API gravity or the sulfur content and are present independent of them. Thus to the extent the District relies on its responses to comments to refute the need to analyze the impacts from these new, distinctly sourced crudes, the District is incorrect.

The vapor pressure of crude determines to a large extent the amount of reactive organic compound (ROG) and Toxic Air Contaminant (TAC) emissions that are released when crude is transported, stored, and refined. Thus, a crude slate may even have identical sulfur content and weight, but would still result in dramatically different ROG and TAC emissions.[45] Similarly, the nature of the chemical bonds in crude determines the amount of energy and hydrogen that must be supplied to refine it. Thus, a crude slate may have identical sulfur and weight, but a different mix of chemicals that would affect the amount of energy and hydrogen required to convert it into refined products.[46]

These differences—in both chemical and physical characteristics other than API gravity and sulfur content— fluctuate independent of sulfur content and API gravity and will result in significant impacts that have not been considered by the District, and are absent from the District's responses to comments, and the Final Negative Declaration analyses. Just some of these impacts include, for example, significant increases in ROG emissions, contributing to existing violations of ozone ambient air quality standards; significant increases in TAC emissions, resulting in significant health impacts in an already over-burdened local setting as described in more detail below; significant increases in malodorous sulfur compounds, resulting in significant odor impacts; significant increases in combustion emissions, contributing to existing violations of ambient air quality standards; and significant increases in flammability, thus increasing the potential for more dangerous accidents involving storage and process equipment

Moreover, as explained in response to similar project proposals, the above crude characteristics also contribute to train derailments or spills on-site.[47] And, the Final Negative

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[45] *See* Exhibit U, Dr. Fox report to Valero Crude By Rail Project EIR – Benicia.
[46] *Id*.
[47] *Id*.

Declaration and the District's responses to CBE comments fail to respond to CBE comments raising these concerns. For example, the District stated in the Final ND that a new condition will be set so that the Project tanks will not receive crude oil brought in by rail. Because the project tanks represent an extremely large new source of crude oil storage and throughput (over 50 million barrels per year in throughput), this condition does preclude the Project from having a significant potential to allow an increase in transport by rail. Indeed, the extent of increase in the overall throughput capacity involved in the project, appears to show that the Project will free up other existing storage tank space in the refinery. Since the refinery is not taking a permit requirement that precludes crude by rail offloading to *all* refinery tanks, the Project also has the potential to also allow an increase in crude offloading by rail in other parts of the refinery, in addition to the crude offloading by ship to these Project tanks. Consequently, the potential impacts from rail still need to be evaluated.

3. The District's decision to approve and certify the Negative Declaration ignores cumulative impacts from other projects and environmental justice concerns.

Currently there are 3 refinery projects being proposed in Wilmington and the adjacent City of Carson, as well as additional project-related permit applications at various stages of review by the District. All 3 projects directly impact many of CBE's members and other residents living *directly on the fenceline* of the refineries at which they are being proposed.

These 3 projects include:

1) The Project at issue in this appeal;

2) The Phillips 66 Wilmington Ultra Low Sulfur Diesel Project, for which the District issued a Draft EIR on September 26, 2014; and

3) The Tesoro-BP Refinery Integration Project, for which the District issued a Notice of Preparation of a Draft Environmental Impact Report on September 9, 2014 (and for which the District is also reviewing two Title V permit revisions and renewals--for the Tesoro Marine Terminal 2 and the Tesoro Hynes Terminal in Long Beach).

Wilmington and the cities of Carson and Long Beach rank among the State's top most

pollution-burdened and vulnerable areas.[48] Residents of these communities live with the day-to-day impacts of various forms of heavy industry, oil extraction and refining operations, port and other goods-movement and transport activities, including significant levels of air pollution caused by diesel truck and railroad transport.[49] As such, these residents rely heavily on the oversight of agencies like the District to ensure that permitting and project approval decisions regarding additional, highly polluting industrial projects are made wisely, with careful attention to the true range of environmental and health impacts resulting from each individual project alone, and in the context of existing cumulatively considerable burdens.[50]

Despite the existing burden on this area, the District is conducting an impermissibly superficial level of environmental review for projects directly impacting some of the region's most vulnerable neighborhoods. While this problem is in large part a result of inaccurate and often misleading project descriptions contained in the applications submitted by refinery operators, the District is responsible for ensuring that CEQA and other air quality and human health protective requirements are met before it moves forward in issuing or approving any permits or other project-related approvals, including approvals of environmental review documents and permit renewals or revisions.[51]

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[48] Wilmington, Carson and parts of Long Beach rank in the top 20% (with several areas in the top 5%) most overburdened and vulnerable areas in the State according to the most recent version of the California Environmental Protection Agency's CalEnviroScreen, version 2.0. (*See* http://oehha.maps.arcgis.com/apps/OnePane/basicviewer/index.html?&extent={"xmin":-13166567.802417224,"ymin":4001409.3038827637,"xmax":13157213.82108084,"ymax":4005584.676552836,"spatialReference":{"wkid":102100}}&appid=a4a95185c71f4817bf03aeae25923695 (last accessed, Dec. 23, 2014).

[49] *See Id.*

[50] *See, Laurel Heights Improvement Assn. v. Regents of Univ. of California* (1988) 47 Cal.3d 376, at 394 (holding that the significant cumulative effects of a project must be considered in an EIR, and specifying that such required cumulative effects should encompass "past, present, and reasonably anticipated future projects.); *see also*, CEQA Guidelines, § 15064 (h)(1) (also requiring preparation of an EIR, where cumulative impacts are considerable, and providing that "[w]hen assessing whether a cumulative effect requires an EIR, the lead agency shall consider whether the cumulative impact is significant and … An EIR must be prepared if [a] Project's incremental effect, though individually limited, is cumulatively considerable[,]" meaning that "incremental effects of an individual project are significant when viewed in connection with the effects of past projects … other current projects, and … probable future projects"), and §15355 ("'Cumulative impacts' refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts"); *see also*, Clean Air Act, Declaration of Purpose, at 42 U.S.C. § 7401(b)(1)-(3), (c)(providing that the purpose of the Act is to enhance the quality of the Nation's air resources so as to promote the public health and welfare; and to encourage and assist the development and operation of regional air pollution prevention and control programs to do the same.).

[51] *See* Cal. Pub. Res Code § 21082.2(a) (requiring the lead agency to determine whether a project may have a significant effect on the environment based on substantial evidence in light of the whole record.); *see also Citizens*

4. The District has no process for appealing a staff's decision on a negative declaration.

Counsel for CBE has extensively reviewed the District Rules, website and other materials. There are no procedures for appealing staff decisions on CEQA documents for projects where the District is the lead agency. Also, the Final Negative Declaration included no procedures for appealing the decision. Given the vital import of this project and the information provided on the processing of more dangerous crude oil at this facility, the public and the Governing Board members must have a robust review process. Accordingly, the District should withdrawl its staff approval, adopt a procedure for processing appeals of this sort through an official process, and then process this appeal according to these duly adopted protocols. If the District decides to process the appeal in an ad hoc manner, we respectfully request that CBE be provided at least 30 minutes to present to the Governing Board. Moreover, the public should be provided the opportunity to comment on this item at a duly noticed Governing Board meeting.

Assoc. For Sensible Development of Bishop Area v. County of Inyo (1985) 172 Cal.App.3d 151("The lead agency must consider the whole of an action, not simply its constituent parts, when determining whether it will have a significant environmental effect."); and *see* CEQA Guidelines § 5041(setting forth the Lead Agency's Authority to mitigate negative environmental impacts, and providing that "A lead agency for a project has authority to require feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant effects on the Environment.").

III. CONCLUSION

For these reasons, and for the additional reasons expressed in CBE's comments on the above listed projects, as well as the additional, attached correspondence and exhibits we appeal the District's certification of the Negative Declaration and we urgently request that Governing Board take immediate steps to withdraw the December 12, 2014 Notice of Determination, approval and certification of the Final Negative Declaration for the Phillips 66 Carson Project.

Dated: January 9, 2015

Respectfully submitted,

/ s

Yana Garcia, Staff Attorney
Maya Golden-Krasner, Staff Attorney
Attorneys for Petitioner
COMMUNITIES FOR A BETTER ENVIRONMENT

List of Exhibits in Support of CBE Appeal of SCAQMD Dec. 12, 2014 Notice of Determination for the Phillips 66 Carson Crude Oil Storage Capacity Project – SCH No. 2103091029

**Please note that exhibits I and P have been stricken as duplicative, and exhibit X has been added from the previous list submitted to the Board Clerk; the Declaration accompanies CBE's appeal.*

Exhibit A	1_2_14 Rail_Safety_Alert Bakken Crude
Exhibit B	Chevron Richmond Refinery Modernization Appendix_3_overview of refineries
Exhibit C	Major Accidents at Chemical and Refinery Plants Contra Costa County Report.
Exhibit D	Norwegian Science and Tech on Sour Crude processing problems
Exhibit E	H2S tfacts114 ATSDR
Exhibit F	CEC-600-2006-006 California Crude Oil Production and Imports
Exhibit G	Alaska North Slope Crude production graph USEIA
Exhibit H	AWB Crude CrudeMonitor.ca - Canada
~~*Exhibit I~~	~~P66 Transcript Q3 2014 10292014 Conference Call Earnings and plans~~
Exhibit J	Q32014InvestorUpdatePSX P66
Exhibit K	After the Oil Rush – ANS. Report
Exhibit L	2014-fact-book_v001_e5w4rc P66
Exhibit M	Application Crude Storage Tank Project docs - Carson Facility
Exhibit N	Letter to Los Angeles City Council and SCAQMD Board member Joe Buscaino and Dr. Wallerstein, January 2013
Exhibit O	SCAQMD Crude Quality – Health Letter, April 2013
~~*Exhibit P~~	~~Crude Storage Tank Project Permit Documents~~
Exhibit Q	2014-dec5-SCAQMD Board Meeting Agenda
Exhibit R	SCAQMD Crude Quality – Health Letter
Exhibit S	JMay CBE Comments Tesoro storage tank ND final
Exhibit T	Karras Exp Rpt Rodeo (LP12–2073)
Exhibit U	Dr. Fox Comments to Valero Crude By Rail Project, Benicia, September 9, 2014
Exhibit V	Dr. Fox Comments to Revised DEIR for the Phillips 66 Rail Spur Extension and Crude Unloading Rack Project 11-24-14
Exhibit W	CBE Comment to Revised DEIR for Phillips 66 Rail Spur Extension and Crude Unloading Rack Project
*Exhibit X	Julia E May Declaration in Support of CBE's Appeal of the SCAQMD's Notice of Determination, approval and certification of the Final Negative Declaration for the Phillips 66 Carson Crude Oil Storage Capacity Project, Jan. 9, 2015

The Pipeline and Hazardous Materials Safety Administration
1200 New Jersey Avenue, SE
Washington, DC 20590
www.phmsa.dot.gov

Safety Alert -- January 2, 2014

Preliminary Guidance from OPERATION CLASSIFICATION

The Pipeline and Hazardous Materials Safety Administration (PHMSA) is issuing this safety alert to notify the general public, emergency responders and shippers and carriers that recent derailments and resulting fires indicate that the type of crude oil being transported from the Bakken region may be more flammable than traditional heavy crude oil.

Based upon preliminary inspections conducted after recent rail derailments in North Dakota, Alabama and Lac-Megantic, Quebec involving Bakken crude oil, PHMSA is reinforcing the requirement to properly test, characterize, classify, and where appropriate sufficiently degasify hazardous materials prior to and during transportation. This advisory is a follow-up to the PHMSA and Federal Railroad Administration (FRA) joint safety advisory published November 20, 2013 [78 FR 69745]. As stated in the November Safety Advisory, it is imperative that offerors properly classify and describe hazardous materials being offered for transportation. 49 CFR 173.22. As part of this process, offerors must ensure that all potential hazards of the materials are properly characterized.

Proper characterization will identify properties that could affect the integrity of the packaging or present additional hazards, such as corrosivity, sulfur content, and dissolved gas content. These characteristics may also affect classification. PHMSA stresses to offerors the importance of appropriate classification and packing group (PG) assignment of crude oil shipments, whether the shipment is in a cargo tank, rail tank car or other mode of transportation. Emergency responders should remember that light sweet crude oil, such as that coming from the Bakken region, is typically assigned a packing group I or II. The PGs mean that the material's flashpoint is below 73 degrees Fahrenheit and, for packing group I materials, the boiling point is below 95 degrees Fahrenheit. This means the materials pose significant fire risk if released from the package in an accident.

As part of ongoing investigative efforts, PHMSA and FRA initiated "Operation Classification," a compliance initiative involving unannounced inspections and testing of crude oil samples to verify that offerors of the materials have been properly classified and describe the hazardous materials. Preliminary testing has focused on the classification and packing group assignments that have been selected and certified by offerors of crude oil. These tests measure some of the inherent chemical properties of the crude oil collected. Nonetheless, the agencies have found it necessary to expand the scope of their testing to measure other factors that would affect the proper characterization and classification of the materials. PHMSA expects to have final test

results in the near future for the gas content, corrosivity, toxicity, flammability and certain other characteristics of the Bakken crude oil, which should more clearly inform the proper characterization of the material.

"Operation Classification" will be an ongoing effort, and PHMSA will continue to collect samples and measure the characteristics of Bakken crude as well as oil from other locations. Based on initial field observations, PHMSA expanded the scope of lab testing to include other factors that affect proper characterization and classification such as Reid Vapor Pressure, corrosivity, hydrogen sulfide content and composition/concentration of the entrained gases in the material. The results of this expanded testing will further inform shippers and carriers about how to ensure that the materials are known and are properly described, classified, and characterized when being shipped. In addition, understanding any unique hazards of the materials will enable offerors, carriers, first responders, as well as PHMSA and FRA to identify any appropriate mitigating measures that need to be taken to ensure the continued safe transportation of these materials.

PHMSA will share the results of these additional tests with interested parties as they become available. PHMSA also reminds offerors that the hazardous materials regulations require offerors of hazardous materials to properly classify and describe the hazardous materials being offered for transportation. 49 CFR 173.22. Accordingly, offerors should not delay completing their own tests while PHMSA collects additional information.

For additional information regarding this safety alert, please contact Rick Raksnis, PHMSA Field Services Division, (202) 366-4455 or E-mail: Richard.Raksnis@dot.gov. For general information and assistance regarding the safe transport of hazardous materials, contact PHMSA's Information Center at 1-800-467-4922 or phmsa.hm-infocenter@dot.gov**.**

APPENDIX 3

Overview of Oil Refining Process

APPENDIX 3
OVERVIEW OF OIL REFINING PROCESS

This appendix provides a high-level, non-project specific description of the refining process as it generally occurs at the Chevron Richmond Refinery (Facility or Project site).

The refining process begins when *crude oils* or *externally sourced (purchased) gas oils* are delivered to the Facility as raw materials or feedstocks. These feedstocks are then refined in five main process steps:[1]

- *Distillation* occurs when crude oil is separated by "distilling" into various components, called "crude oil fractions;"
- *Treatment* occurs when crude oil fractions are "treated" to remove sulfur and other natural impurities;
- *Cracking* occurs when molecules in the heavier crude oil fractions are divided by *cracking* these larger molecules into smaller molecular forms that can become transportation petroleum products;
- *Reshaping* (also called "reforming") occurs when these molecules are "shaped" to meet the specifications for various kinds of products (e.g., octane levels in gasoline); and
- *Blending* occurs in the final product production process, when multiple hydrocarbon fractions are blended to meet the specifications for particular products (e.g., higher octane versus lower octane gasolines). *Blending* occurs

[1] While these five major steps in the refining process are described as discrete steps, not all hydrocarbon molecules in the refining process go through each of these steps, and some of these refining process steps are actually repeated in later refining steps. For example, the first step in the process, *Distillation*, describes the process of applying heat to crude oil to separate it into "fractions," or separate streams of hydrocarbon molecules that boil at different temperature ranges. The fractions are then piped on to different refinery processing steps to produce different products. While the major distillation process occurs as the first step in the refining process at the crude unit (described in the *Distillation* step below), smaller distillation units also operate at several later stages in the refinery process. For example, the hydrotreating process (described in the *Treatment* step below) results in some cracking (described in the *Cracking* step below), and the cracked hydrocarbon output then is run through a fractionator (a type of distillation unit) to again separate this output into fractions as needed for the next processing steps.

when different products are piped into tanks and typically does not involve mechanical mixing.

The refining process as a whole is depicted in Figure A3-1, *Facility Process Diagram*. A description of the feedstocks processed by the Facility is provided below, followed by a description of each of these major processes.

3.1 FEEDSTOCKS

Crude oil is the Facility's primary "feedstock," which is the raw material used to make refined petroleum products. A partially refined crude oil fraction called "gas oil" is also received by the Facility and is purchased from external sources (i.e., other refineries). Crude oil and gas oil are described below.

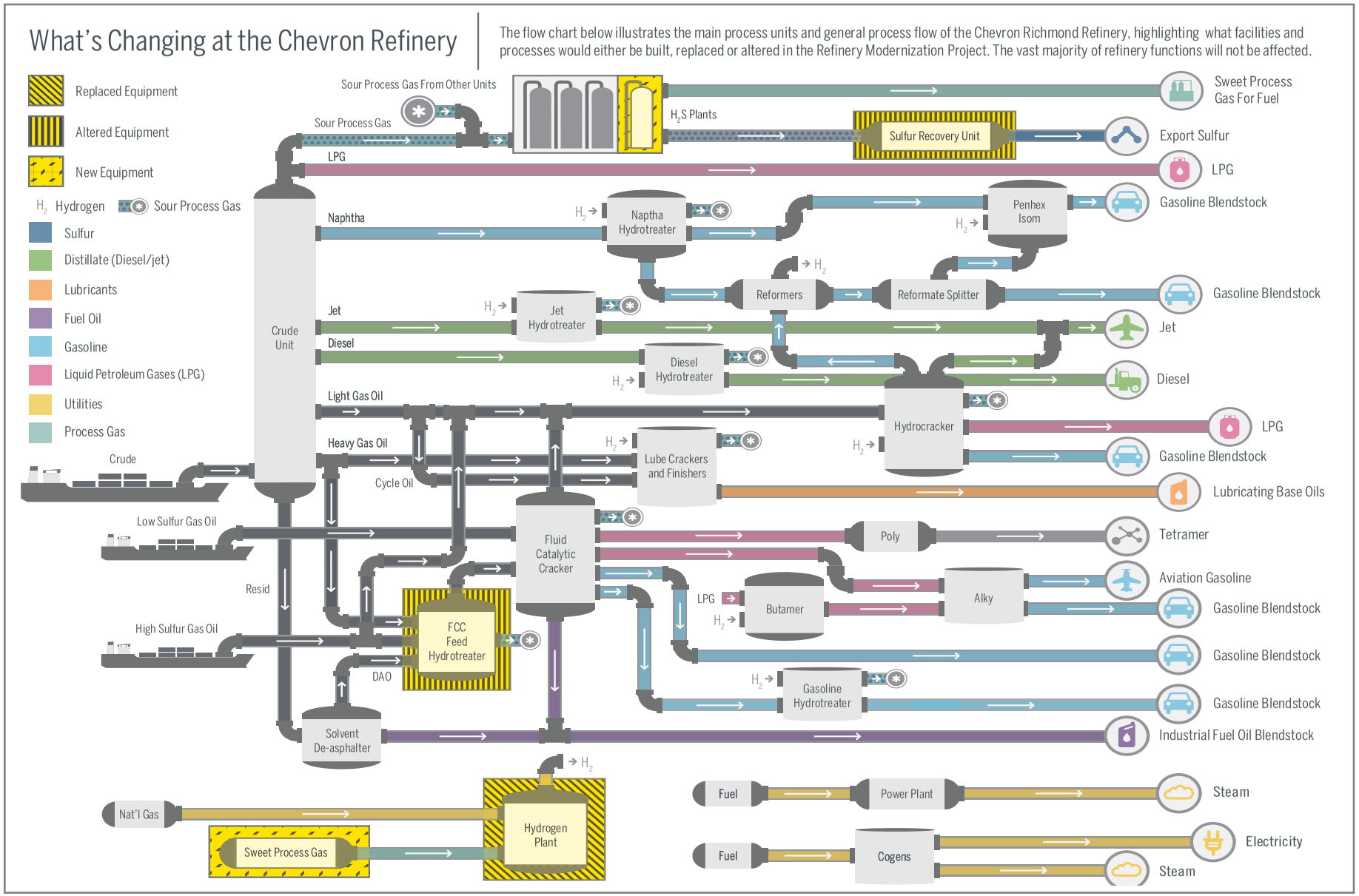
3.2 IMPORTANT CHARACTERISTICS OF CRUDE OIL

Crude oil is found deep beneath the earth's surface in natural underground reservoirs. Crude oil is believed to have been formed from a mixture of mud and very small plants and animals (algae and zooplankton) that lived in ancient seas and oceans millions of years ago. Crude oil was created from this mix through a combination of temperature, pressure, and time.

Crude oil is recovered primarily from oil extraction wells, and it is often temporarily stored near extraction areas before being transported (primarily by pipelines and ships) to refineries for processing. Unlike many other refineries in the United States, the Facility is not connected to crude oil supplies through pipelines. Instead, the Facility receives crude oil via tankers and barges that discharge at the Project site over the Long Wharf. Crude oil is stored in tanks at the Project site before being processed in the Facility.

Crude oil is not a single chemical compound. Instead, crude oil is a mixture of different chemical compounds, the vast majority of which include a combination of hydrogen and carbon atoms, and are thus called "hydrocarbons." Other atoms, including nitrogen and sulfur atoms, can also be part of hydrocarbon molecules. Crude oil hydrocarbons may also contain small amounts of metals. Crude oil also typically includes small amounts of non-hydrocarbon contaminants, such as sediment, salt, and water.

The different hydrocarbon compounds in crude oil have different boiling points (the temperature at which liquids "boil"). Heating crude oil and condensing the heated vapors causes it to be physically separated into different streams of hydrocarbons (called "fractions") through a simple distillation process (described further below).



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Source: Chevron (T39r2)

Figure A3-1
Chevron Refinery Modernization Project EIR
Facility Process Diagram

One of the hydrocarbon fractions produced in the Facility's refining process is "gas oil," which is produced during the distillation process and various other processes. In addition to producing gas oil from crude oil feedstocks, Chevron imports surplus gas oil from other refineries. The Facility imports gas oil because it contains equipment that can refine more gas oil than what can be produced economically from its crude oil feedstock. In other words, the crude unit, the solvent de-asphalting unit (SDA unit, described below), and other process units that produce gas oil produce a smaller amount than later steps in the refinery processes can refine due to that equipment's greater capacity. Because a refinery's "efficiency" (also discussed in greater detail below) is directly linked to maximizing utilization of refinery equipment, Chevron imports purchased gas oil to efficiently utilize available Facility capacity.

3.2.1 Density or "Gravity" of Crude

"Density" is the amount of mass contained in a certain volume. The density of a crude oil is determined by the average weight (or "gravity") of its component molecules. "Heavy" crude oil is denser than "light" crude oil because the hydrocarbon molecules in heavy crude oil are larger and have more carbon atoms than those in light crude oil.[2] Atoms in a larger molecule are tightly bound together and take up less space than the same number of atoms spread out across multiple smaller molecules. Thus the atoms in heavy crude oil are more tightly packed together, taking up less space (volume) and making heavy crude oil denser than light crude oil.

Less dense (or "light") crudes generally have more light hydrocarbons, and light hydrocarbons are the constituents of higher-value refinery products such as gasoline, jet fuel, and diesel. Similarly, the denser ("heavier") crudes generally contain more of lower-value products like gas oil, tar, and bunker fuel commonly used in shipping.

When a refinery processes light crudes, higher-value products can be produced in fewer steps. For example, a light crude may only need to be "distilled" (the first step in the refinery process, described below) to produce large amounts of gasoline *blendstocks*. In contrast, a heavy crude may need to go through all of the refinery processes explained below (*Distillation*, *Treatment*, *Cracking*, and

[2] Heavy crude oil can also be denser than light crude oil because a higher proportion of the hydrocarbon molecules are in a denser form. (This characteristic is identified by the percentage of naphthenes in the crude.) Hydrocarbon molecules that are highly naphthenic can have molecules with the same number of carbon atoms, but those atoms are shaped like a circle rather than a straight chain. The circular structure is more dense than the straight chains.

Reshaping) to produce the same amount of gasoline or other light products. It should be noted that the *very* light hydrocarbons, at the other end of the gravity range, also have limited value. The ultimate light hydrocarbon is methane gas (CH_4), which is the primary component of natural gas. It can be quite a bit less valuable than even crude oil because natural gas is generally widely available. Therefore, the price paid for a "condensate" (a very light combination of hydrocarbons), can be less than a crude oil with significant mid-range hydrocarbon molecules.

The density or gravity of crude oil is important to the refining process in several ways. As mentioned above, when the mixture of compounds in crude oil is heated, lighter hydrocarbon compounds will begin to vaporize (turn into gas), and heavier compounds will not. As the temperature within this initial crude processing step is increased, heavier hydrocarbons will begin to vaporize.[3] This physical characteristic of crude oil is key to the first step in the refining process: *Distillation*, in which crude oil (which has been desalted as described below) is heated in a furnace and sent to a large steel column to separate out the different hydrocarbons.

Different hydrocarbons boil at different temperature ranges and are grouped together in "fractions" based on these temperature ranges. The typical boiling temperatures of different fractions are shown in Figure A3-2, *Typical Boiling Temperatures (Cut Points) for Different Hydrocarbon Fractions*. Larger molecules contain more carbon atoms, are generally denser, and have a higher boiling point. Conversely, compounds with a lower carbon count are less dense and boil at a lower temperature.

For example, "gas oil" is the term used to describe the fraction of crude oil that is heavier than common refined products like gasoline, diesel, and kerosene or jet fuels—but lighter (less dense) than the heaviest fractions, which are called "residue" or "residuum." Petroleum scientists devised a unique name for measuring the density, or weight, of a given hydrocarbon compound, called "American Petroleum Institute (API) gravity." API gravity describes the density of a crude oil compared to the density of water. The lower the API gravity, the heavier the crude.[4] The API gravity can be used to categorize crude as "heavy, intermediate, or light" as discussed in Section 4.0.3 of the *Chapter 4, Introduction to Chapter and Methodology*. Definitions for "light" and "heavy" crude oils are based

[3] This is different from water—a single chemical compound of two hydrogen atoms and one oxygen atom, or H_2O—which would eventually all boil away into steam at the constant temperature of 212˚F at normal pressures.

[4] For comparison, water has an API gravity of 10 degrees. Generally, hydrocarbons with an API gravity above 10 degrees are lighter than water and will float.

on their specific gravity[5] or API gravity.[6] The following are generally accepted definitions for the crude oil gravities (CEC, 2006):

- **Heavy Crude.** Crude oils with API gravity of 18 degrees or less are characterized as heavy. The oil is viscous and resistant to flow, and tends to have a lower proportion of volatile components.
- **Intermediate Crude.** Crude oils with an API greater than 18 and less than 36 degrees are referred to as intermediate.
- **Light Crude.** Crude oils with an API gravity of 36 degrees or greater are referred to as light. Light crude oil produces a higher percentage of lighter, higher-priced premium products.[7]

3.2.2 Sulfur Content in Crude Oil

Another important natural characteristic of crude oil is that different types of crude oil have differing amounts of sulfur content. Sulfur occurs naturally in crude oil, but sulfur content is restricted by federal and State air quality laws in refined products (e.g., there are standards limiting the amount of sulfur that can be present in refined products like gasoline). To meet these regulatory restrictions on sulfur content in refined products, sulfur is removed from the various fractions of crude oil during the refining process.

When an oil has less sulfur, it is referred to as being "sweet." Crudes with more sulfur are referred to as being "sour." Although there is no regulatory threshold of sulfur content for dividing sweet crude oils from sour crude oils, oils with less than 0.5% sulfur content are generally referred to as "sweet."

Most sulfur present in crude oil is bonded within hydrocarbon molecules, although some is present as hydrogen sulfide (H_2S) gas . This is different from "elemental" or pure sulfur (a yellow crystalline substance when at room temperature), which is a usable product. During the refining process, the sulfur atom is removed from the hydrocarbon molecule. This process is called

[5] The specific gravity equals the weight of the compound divided by weight of an equal volume of water.

[6] The API gravity, measured in degrees (°), is defined as equal to (141.5 divided by specific gravity)—131.5. As a result, the higher the API gravity, the lighter the compound. Note that water has an API gravity of 10°, so any hydrocarbon crude with an API gravity greater than 10° is less-dense (lighter) than water.

[7] These API breakpoint values are not applied universally. Other petroleum industry sources use varying breakpoints for heavy and light crude oils. The term "intermediate" is also used interchangeably with the term "medium" when referring to mid-range gravity crudes.

"hydrotreating" because it includes the use of hydrogen. The hydrocarbon fractions are combined with hydrogen in the presence of a catalyst and elevated temperatures and pressures. The catalyst, temperature, and pressure separate the sulfur from the hydrocarbon molecule and the sulfur combines with the available hydrogen to produce a gas called hydrogen sulfide (H_2S). This hydrogen sulfide gas is then treated, as explained below, to create "elemental" sulfur, which is sold as a product by Chevron. The Modernization Project includes several components to allow Chevron to remove more sulfur from the Facility's feedstocks and thereby refine higher sulfur crude oil and gas oil in the future.

3.3 CUTTER AND BLENDSTOCKS

In addition to feedstocks imported by the Facility for processing into transportation fuels and base oils, the Facility imports a small amount of blendstocks to be used in making final products that leave the Facility. The Facility imports two main types of blendstocks, a fuel oil blendstock called "cutter" and light product blendstocks, both of which are imported over the Long Wharf. Once on-site, blendstocks are not processed by the Facility, but rather serve as one of the components when mixing other Facility-produced blendstocks into finished products.

Cutter is used by the Facility to lower the viscosity of fuel oil product. The Facility has several process units that create material that can be used as cutter (e.g., cycle oil) and the Facility can always produce sufficient quantities to meet the Facility's overall cutter demand. As a result, cutter import is unrelated to refinery utilization. Nevertheless, there are times, such as when another facility has a surplus of cutter, in which the Facility may import material from other facilities (including other Chevron facilities) to be used as cutter instead of using internal sources.

Similarly, light product blendstocks can be imported, dependent on market conditions, into the Facility to supplement the various blendstocks or products that are produced by the Facility process units. These blendstocks (e.g., iso-octane) are used in the blending of finished products such as gasoline, but again are not used as feed to the Facility process units.

3.4 OVERVIEW OF THE REFINING PROCESS

3.4.1 Distillation: Separating the Fractions of Crude Oil with Heat

3.4.1.1 Crude Oil is First Pre-Heated and Treated to Remove Contaminants

Before crude oil goes through the first major step of the refining process, *Distillation,* it is preheated and treated to remove contaminants. First, the crude oil is delivered on ships, pumped into holding tanks, and then pumped from those tanks to the crude unit. En route, the crude oil is heated in a series of "heat

exchangers," where heat from steam or already-heated product is transferred to the incoming cooler crude oil feedstock. (See below for a description of heat exchangers.)

Crude oil typically contains a small percentage of water and salts dissolved in the water. Because the salts are considered contaminants, after the pre-heating process the heated crude oil is next sent to a "desalter," where these contaminants are removed. This protects the downstream equipment from potential plugging and corrosion mechanisms that can be associated with salts in crude oils.

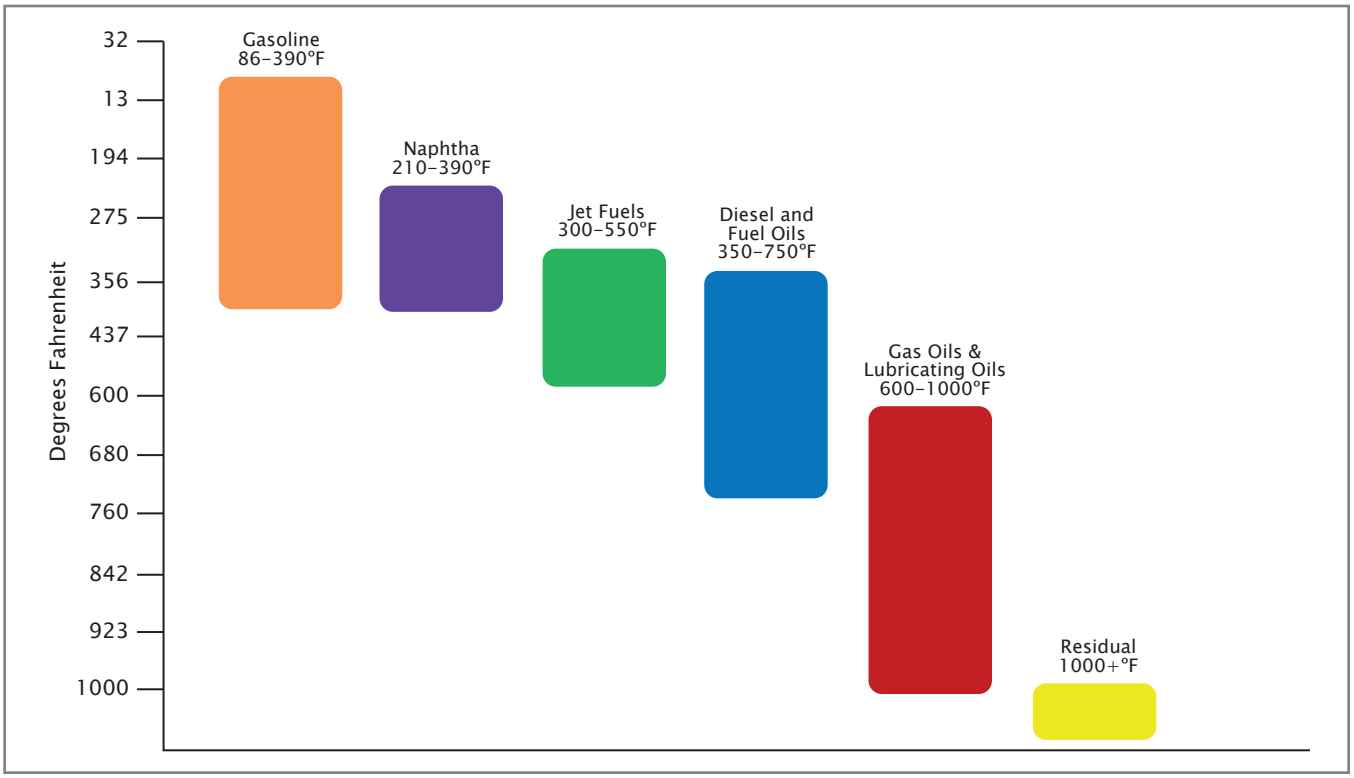
A desalter is a large cylindrical vessel laid horizontally. The desalter removes contaminants from crude oil by first emulsifying (mixing together) the crude oil with wash water to promote thorough contact of the water and oil. The salts dissolve in this water phase. After the oil has been washed and mixed as an emulsion of oil and water, electrostatic fields are used to break the emulsion, separating the crude oil and water again (Johnson, 2014). The mixture of contaminants and water that has been separated from the crude oil is pumped into a wastewater treatment plant as described below.

Next, the crude oil is further pre-heated in heat exchangers and charged to a pre-flash tower. Light ends are flashed off (rapidly heated), and bypass the furnace. By pre-heating the feedstock and flashing off light ends, the process unit furnaces do not have to work as hard to heat the feedstock, saving energy. The remaining crude oil passes through a furnace where it is heated to a temperature of approximately 700°F. At this temperature, typically about half of the crude oil changes from liquid to vapor (see *Figure A3-3, Flow Diagram from Wharf to Crude Unit*). This combination of liquid and vapor is then ready for *Distillation*, the first major step in the refining process, described below.

3.4.1.2 The Primary Distillation Process Occurs in the Crude Unit

Distillation is the process of using heat to separate crude oil into different hydrocarbon streams by boiling point (called "cut points"). These separated "fractions" of crude oil are sent on to different parts of the Facility for further processing. Crude oil *distillation* occurs in the Facility's crude unit. The lighter compounds such as butane, gasoline, jet fuel, and diesel "boil off" (vaporize) at lower temperatures, and as the temperature increases, the heavier compounds such as gas oil vaporize last. The material that does not vaporize is referred to as "residuum."

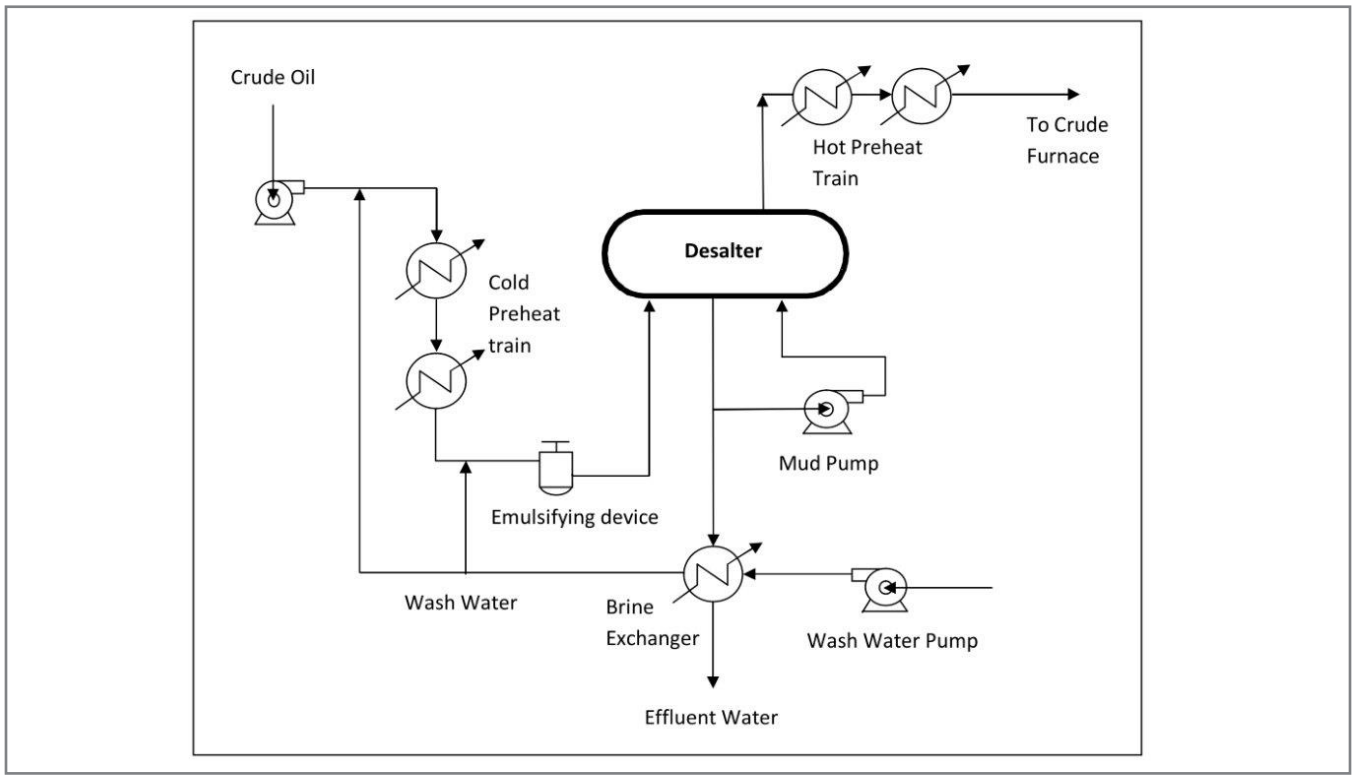
A typical distillation schematic in Figure A3-4, *Distillation Schematic*, shows the separation of crude oil into fractions, from lighter at the top to heavier at the bottom. Figure A3-5, *Distillation Curve,* provides a typical distillation curve,



02.25.2014 P:\11-005 CVRN\PRODUCTS\DEIR\Figures\Appx B_Refinery 101\Draft\CVRN Figure A3-2 & A3-3.pdf

Source: Turner, Mason & Company, 2011

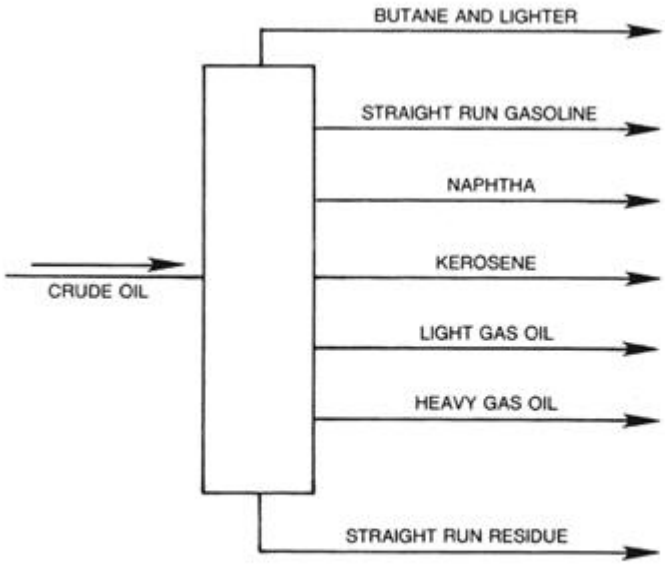
Figure A3-2
Chevron Refinery Modernization Project EIR
Typical Boiling Temperatures (Cut Points) for Different Hydrocarbon Fractions



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Source: Enggcyclopedia, 2014

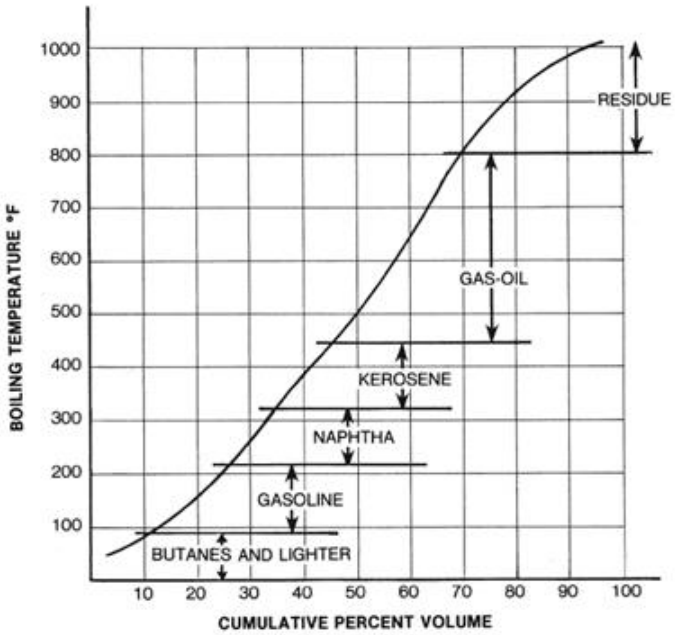
Figure A3-3
Chevron Refinery Modernization Project EIR
Typical Flow Diagram from Wharf to Crude Unit (Including Desalter, Heat Exchangers, Pipes)



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Source: Petroleum Refining in Nontechnical Language, 2008

Figure A3-4
Chevron Refinery Modernization Project EIR
Distillation Schematic



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Source: Petroleum Refining in Nontechnical Language, 2008

Figure A3-5
Chevron Refinery Modernization Project EIR
Distillation Curve

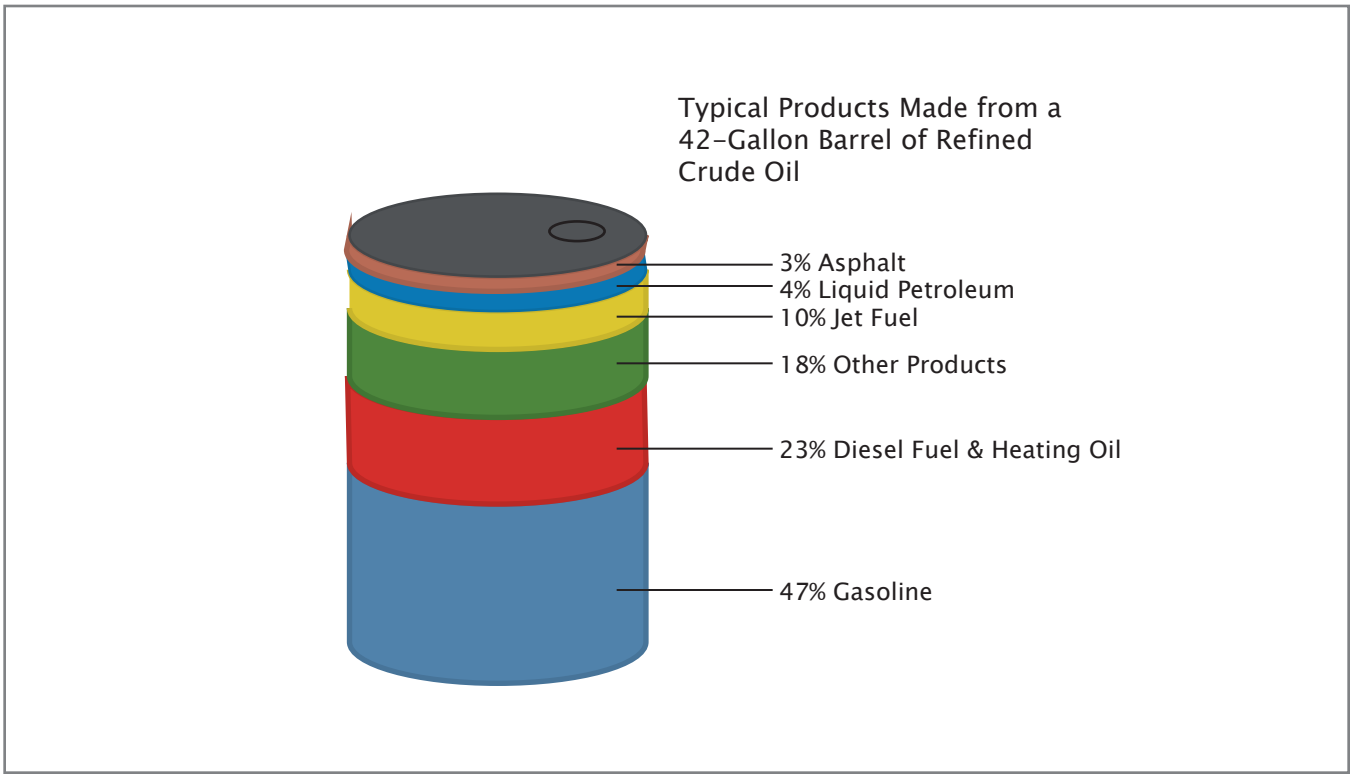
showing volume and boiling temperatures (or "cut points") for the various fractions of crude oil.

Crude oil fractions in the higher boiling point range require more complex equipment to process into transportation fuels and base oils that are in highest demand in the market. Crude oil fractions with lower boiling points still require further processing to meet finished product specifications, but typically require less complex refining. Figure A3-6, *Breakdown of a Typical Crude Oil Distillation Yield*, shows a typical breakdown of the composition of a barrel of crude oil according to the United States Energy Information Administration (EIA). Although this distillation process separates significant quantities of the lower boiling point fractions such as gasoline, by further refining the higher boiling point fractions, such as gas oils, more of the crude oil can be converted to desirable transportation fuels and base oils.

The crude unit is comprised of several pieces of equipment, as depicted in Figure A3-7, *Crude Unit Overview,* each of which is discussed below. The first distillation column in the crude unit at the Facility is the "atmospheric distillation column," which is named "atmospheric" because the pressure in the unit is similar to the outside atmosphere. It operates on the physical principle of temperature to separate different hydrocarbon fractions and send them to different parts of the Facility for further processing. This is possible because, as discussed above, the different groups of hydrocarbon compounds or "fractions" found in crude oil have different boiling points.

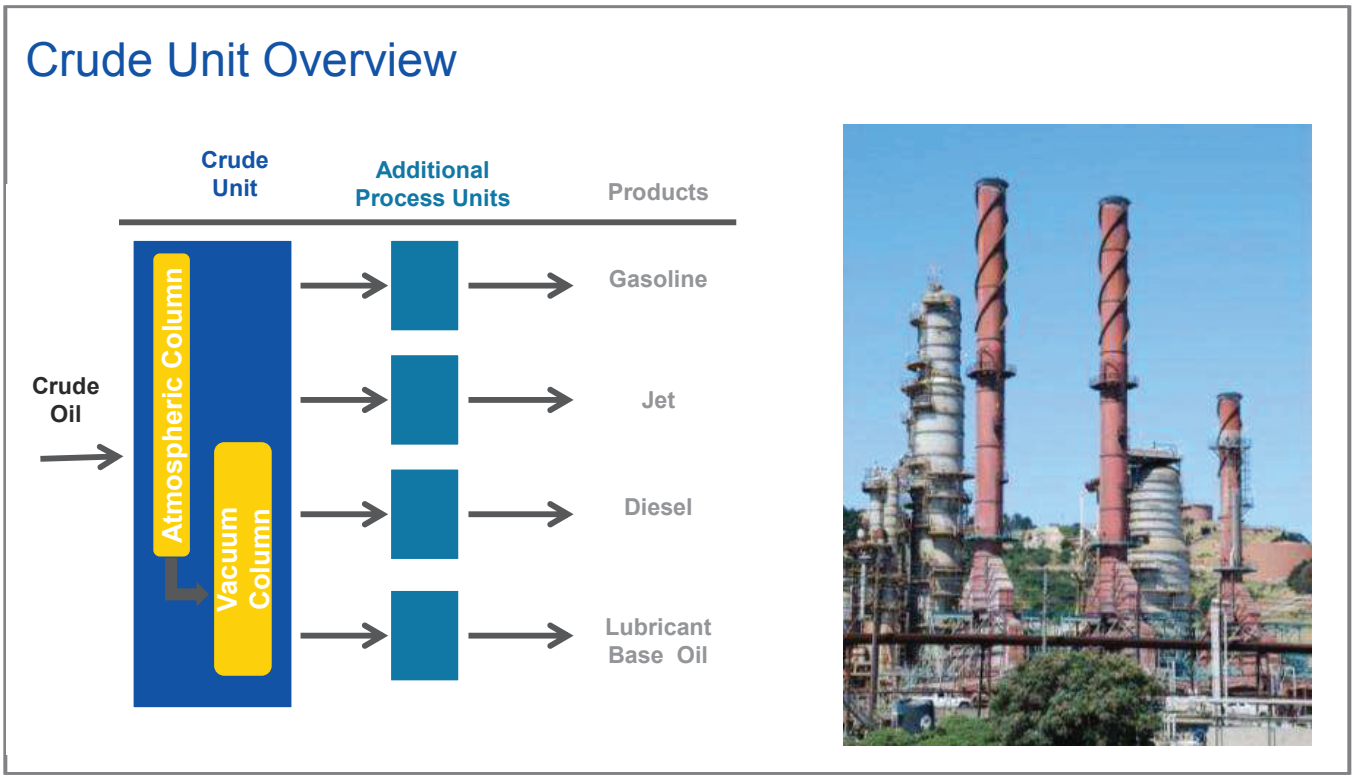
Within the column, the vaporized hydrocarbons rise and the liquid hydrocarbons fall in a column consisting of perforated trays located at 24- to 30-inch intervals. The vapors rise through the perforations in the trays and bubble up through the liquids. As the vapors bubble up through the trays of liquid, some of the heavier (denser) hydrocarbons in the vapor condense (turn back into liquid) and collect on the trays. At several levels on the column, there are "side cuts" that drain liquid forms of hydrocarbons – with lighter products drawn off from the upper parts of the column and heavier liquids drawn from the trays closer to the bottom. Figure A3-8 below, *Distillation Column: Crude Oil Separation by Heat into Fractions* shows a typical separation of crude oil into these fractions, along with general boiling points of these fractions. Each fraction is then sent to different areas of the Facility for further processing.

As shown in the distillation curve in Figure A3-5 above, not all of the hydrocarbon fractions would have vaporized even at the highest temperatures reached in the atmospheric distillation column.



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Source: U.S. Department of Energy, 2014

Figure A3-6
Chevron Refinery Modernization Project EIR
Breakdown of a Typical Crude Oil Distillation Yield



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Source: Chevron, 2012

Figure A3-7
Chevron Refinery Modernization Project EIR
Distillation Column: Crude Oil Separation by Heat into Fractions

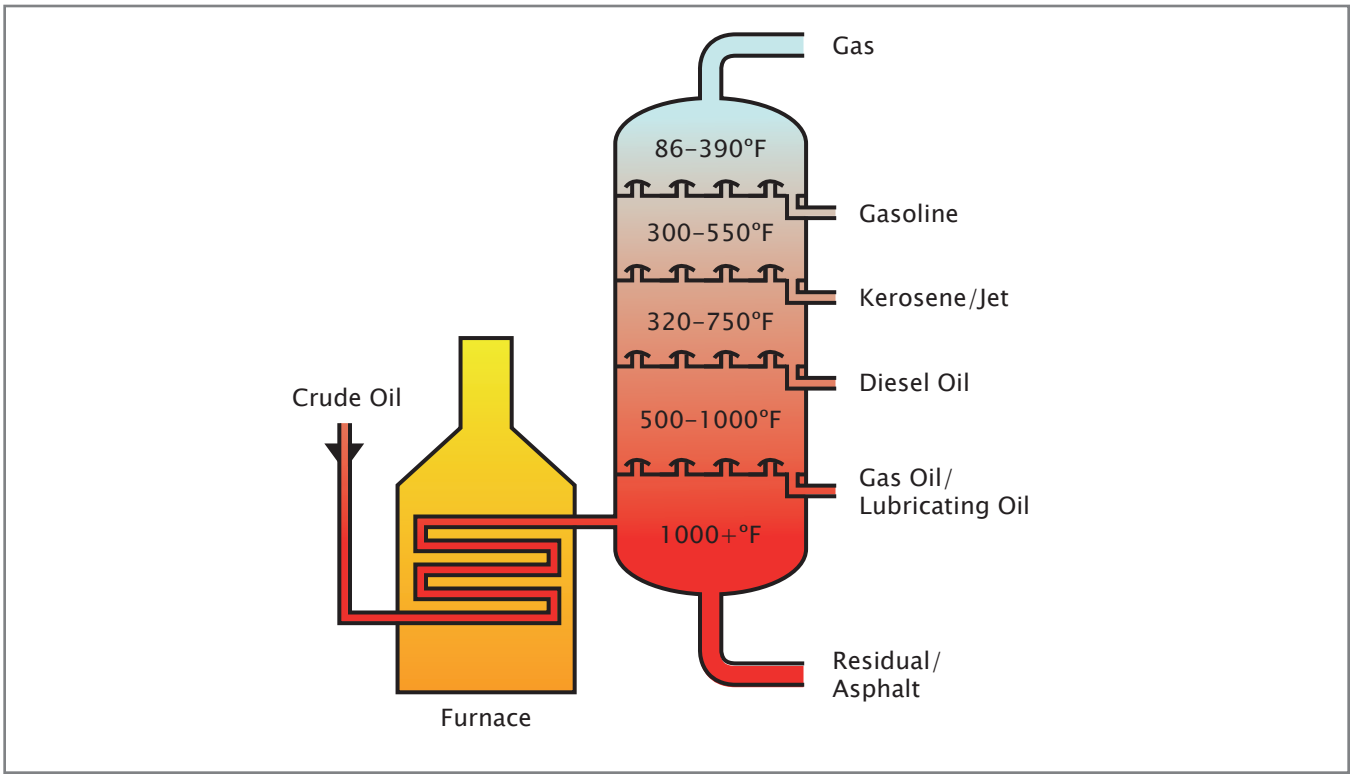
A different process, called "vacuum distillation," is used to help distill these heavier fractions by creating a vacuum condition, which is a pressure below atmospheric pressure. This decreased pressure allows the heavier fractions to boil at lower temperatures (just like water boils at a lower temperature in "thin air" that can be found at high mountain elevations) and be converted to vapor and separated.

At the Facility, this vacuum distillation process for separating the heaviest crude fractions is handled at a second distillation column, called the vacuum distillation column (see Figure A3-9, *Vacuum Distillation Process*), which is also part of the crude unit. The vacuum column construction is slightly different from the atmospheric column to minimize pressure loss in the column. The column includes several sections filled with "packing" material, sheets of metal or ceramic rings to allow the gas and liquid in the column to contact each other. There are trays in the column where light and heavy vacuum gas oil are drawn off. The bottoms from the column are residuum and are fed to the SDA unit (described below) to further separate the gas oil from the residuum.

The heaviest fraction from the vacuum distillation column, the residuum, goes through one more *separation* step before moving on to other processes. To remove the remaining gas oil from the residuum, the Facility uses an SDA unit. The SDA unit uses solvent to chemically dissolve the remaining gas oil molecules in the residuum. The gas oil and solvent mixture is sent to a column that operates at lower pressure. At the lower pressure, the gas oil separates from the solvent. The solvent is reused and the gas oil molecules are sent for further processing in the Facility's fluid catalytic cracker feed hydrotreater (FCC FHT) and fluid catalytic cracker unit (described below). The portion that is not absorbed by the solvent leaves the SDA unit as heavy residuum and leaves the Facility as a fuel oil blendstock product. The solvent is recycled back to the SDA process, where it is reused.

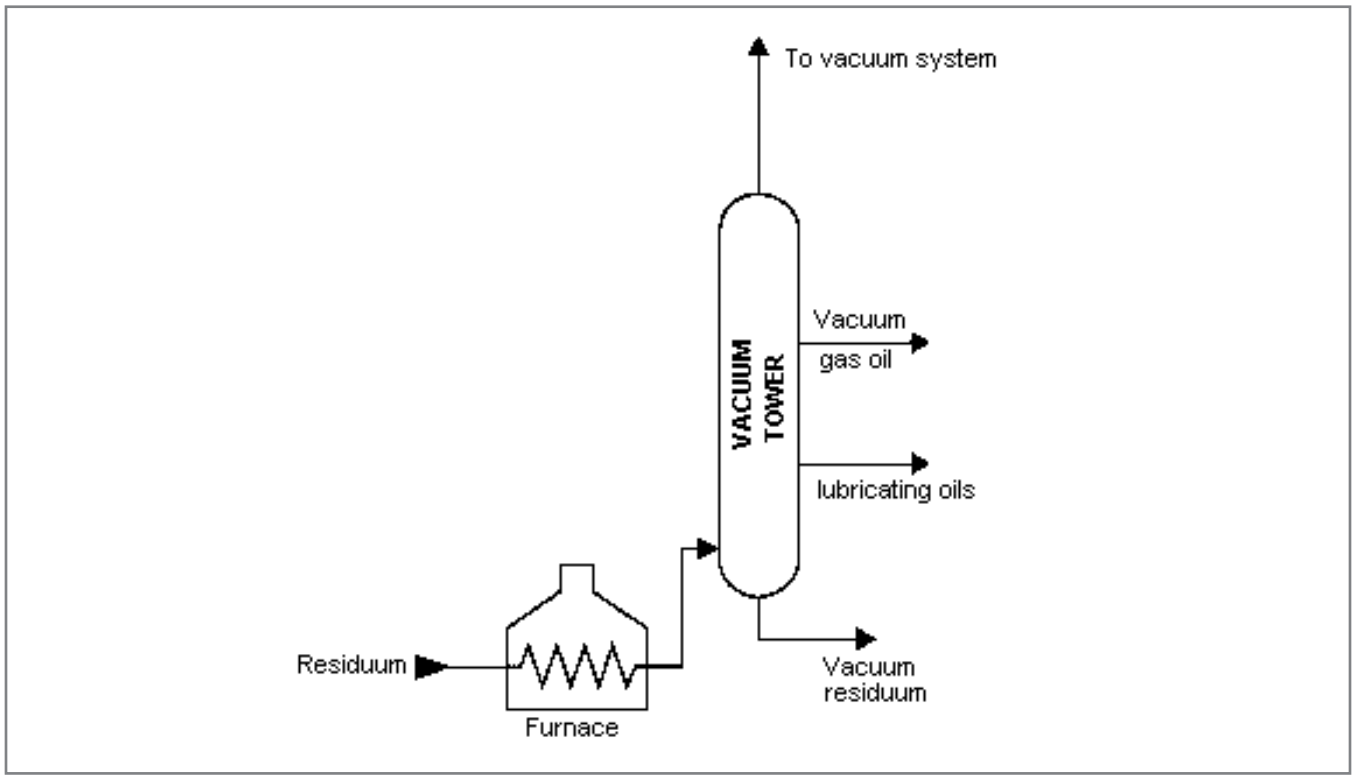
3.4.2 Treatment: Removing Sulfur and Other Natural Impurities

Hydrocarbons separated in the crude unit distillation process and SDA unit contain naturally occurring sulfur and other natural impurities such as nitrogen and metals. One of the key later steps in the refinery process involves chemical reaction processes that include a "catalyst" – a material that promotes or speeds up chemical reactions to produce either a finished product or another interim material to be processed further, such as in the *Cracking* step. These impurities can interfere with the *cracking* processes. In addition, they also reduce the quality and performance of finished transportation products and without sufficient removal may not comply with finished fuel regulatory standards such as Ultra Low Sulfur Diesel and California's stringent "clean fuel" gasoline standards.



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Source: Turner, Mason & Company, 2011

Figure A3-8
Chevron Refinery Modernization Project EIR
Distillation Column: Crude Oil Separation by Heat into Fractions



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Source: Set Laboratories, Inc., 2014

Figure A3-9
Chevron Refinery Modernization Project EIR
Vacuum Distillation Process

The purpose of the *Treatment* step is to largely remove non-hydrocarbon components like sulfur, metals, and nitrogen. *Treatment* primarily occurs when the separated hydrocarbon fractions are sent to "hydrotreaters." The Facility currently operates five hydrotreaters. Each hydrotreater processes different fractions of the crude oil. The diesel hydrotreater (DHT) treats diesel from the crude unit, the jet hydrotreater (JHT) treats jet fuel from the crude unit, and the gasoline hydrotreater (GHT) treats a gasoline product from the fluid catalytic cracker unit, a unit described in *Section 3.4.8* below. These three hydrotreaters—the GHT, DHT, and JHT—are "finishing" units that produce material used in fuel blending for finished products (see *Section 3.4.12* below).

The other two hydrotreaters, the naphtha hydrotreater and the fluid catalytic cracker feed hydrotreater (FCC FHT), primarily function as pre-treaters for petroleum fractions to be used as feeds to other units at the Facility for further processing before turning into finished products. The naphtha hydrotreater treats naphtha, a lighter-end fraction of crude oil distilled and routed from the crude unit to the naphtha hydrotreater. The FCC FHT treats gas oil from the crude unit and gas oil that is purchased from other refineries. The FCC FHT is labeled "FCC feed hydrotreater" because the gas oil it treats is primarily fed into the next unit in the process, called the fluid catalytic cracker, or FCC unit, which is involved in another step in the process, described below in *Section 3.4.8*. See hydrotreaters labeled in Figure A3-1, *Facility Process Diagram.*

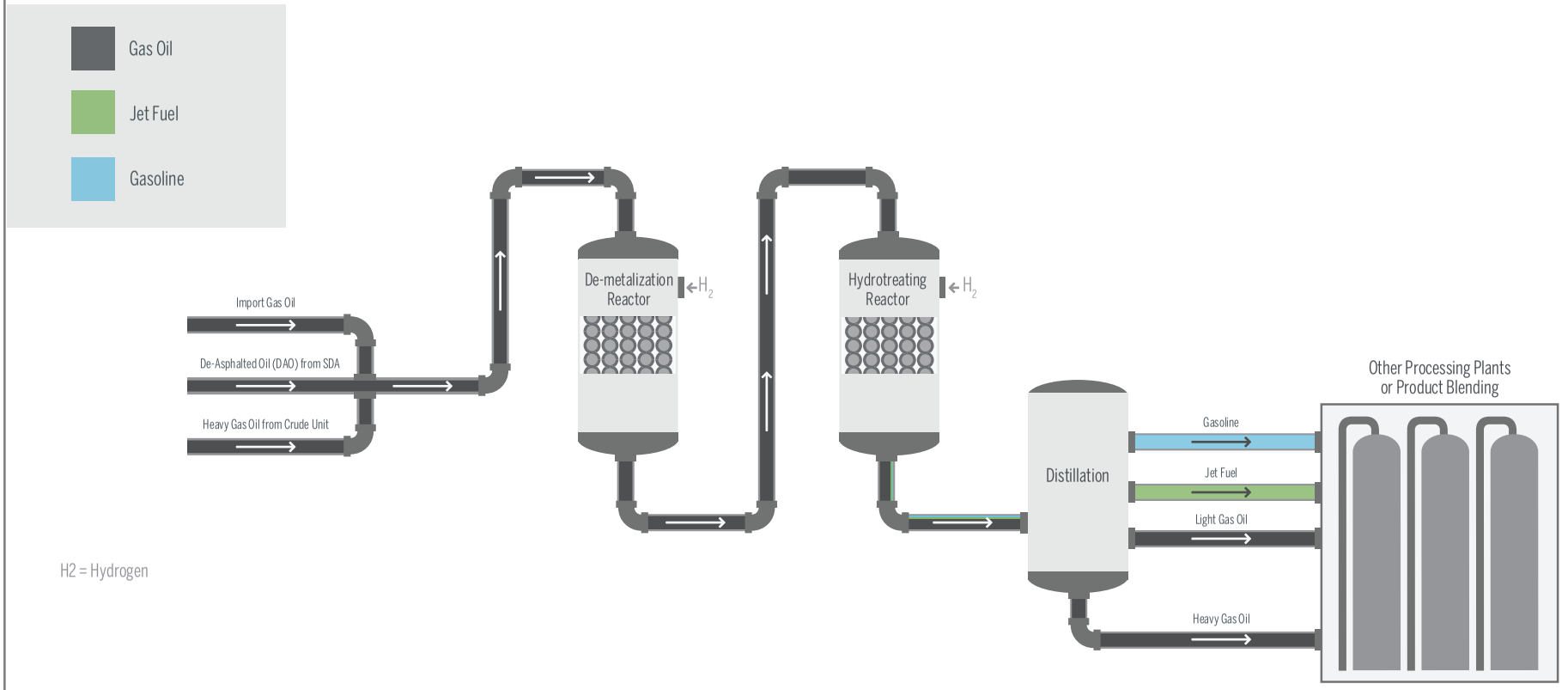
3.4.3 Hydrotreating Removes Sulfur by Reacting Sulfur with Hydrogen to Create Hydrogen Sulfide

In the hydrotreating process, a hydrocarbon stream is fed through a furnace and the hot hydrocarbon and hydrogen gas are charged to a pressurized reactor that contains a catalyst, usually in a pellet form. The combination of catalyst, temperature, pressure, time, and hydrogen causes a chemical reaction in which the sulfur atoms on the hydrocarbon molecule are removed and hydrogen replaces them on the hydrocarbon molecule. The sulfur reacts with the free hydrogen to produce H_2S.

The hydrotreating process requires an excess amount of hydrogen to be present to ensure the greatest removal of the sulfur and nitrogen. Rather than allow the valuable excess hydrogen to be sent to the fuel gas system and burned as a refinery fuel, the excess hydrogen gas from the hydrotreaters is removed in a hydrogen separator and recycled to the process. The output from the reactor is charged to a fractionator to remove the light ends (which now include a combination of usable hydrocarbons, hydrogen, and H_2S). The hydrotreating process is depicted in Figure A3-10, *FCC Feed Hydrotreating Process*.

The FCC Feed Hydrotreating Process

The FCC Feed Hydrotreater (FCC FHT) is designed to remove metals as well as denitrify and desulfurize gas oils prior to being processed by the FCC unit.
Some incidental "cracking" occurs during the hydrotreating process, creating a relatively small amount of lighter products such as gasoline blendstocks and jet fuel.



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Source: Chevron (T39r2)

Figure A3-10
Chevron Refinery Modernization Project EIR
FCC Feed Hydrotreating Process

As shown in the hydrotreating figure, the hydrotreating process relies on hydrogen. As discussed further below, hydrogen comes from four sources at the Facility. It is manufactured at the existing hydrogen plant, it is produced at the reformers, it is recycled when the unreacted hydrogen is recovered from the hydrotreating processes in the Facility, and it is also recovered from process gas through pressure swing adsorption (PSA).

The hydrotreating process occurring in the FCC FHT processing unit also results in some minor incidental cracking, where a catalytic reaction in the presence of hydrogen breaks heavier, longer chain hydrocarbons into lighter, shorter chains like gasoline and jet fuel ("light ends"). This hydrocracking (breaking longer hydrocarbon molecules into smaller ones in the presence of catalyst, temperature, pressure, and hydrogen) is a byproduct of the hydrotreating process. This same cracking phenomenon occurs in all of the hydrotreaters but is less pronounced in the lower pressure hydrotreaters including the NHT, GHT, JHT, and DHT. This "cracking" process is explained further in the next section, since *Cracking* is another major step in the refining process.

3.4.4 Hydrotreating Removes Nitrogen by Creating Ammonia

Similarly, nitrogen atoms on the hydrocarbon molecules are replaced by hydrogen in a chemical reaction, and the nitrogen reacts with free hydrogen to produce ammonia (NH_3).

Hydrocarbon outputs from the various units are frequently steam-stripped (i.e., contacted with steam) or water-washed (contacted with water). The condensed water from steam injected into the processes and water from the water washing process absorb ammonia and some H_2S that were produced in the various units. This water/ammonia/H_2S mixture is charged to a vessel and some of the water is boiled off, yielding concentrated "sour water." The ammonia and H_2S in the concentrated sour water are removed in sour water strippers that heat the sour water and separate the H_2S and ammonia from the water. The water from the sour water stripper is reused or sent to the water treatment facility. The H_2S stream is sent to the sulfur recovery unit. The ammonia is captured and stored for sale or used in the Facility.[8]

[8] Ammonia can be used for removing NOx from furnace stacks in a process called selective catalytic reduction, among other applications..

3.4.5 Amine Treatment Units Remove the Hydrogen Sulfide from Usable Hydrocarbons

As noted above, the *Treatment* step in the refining process also creates byproducts including H_2S that must also be managed. At the Facility, the H_2S gas created by the hydrotreaters is routed to a unit called an "H_2S absorber," which contains a solvent—diethanolamine (DEA)—designed to absorb the H_2S molecules and separate them from hydrogen and hydrocarbon gas streams. DEA liquid is mixed with the hydrogen sulfide rich gas in the H_2S absorber.

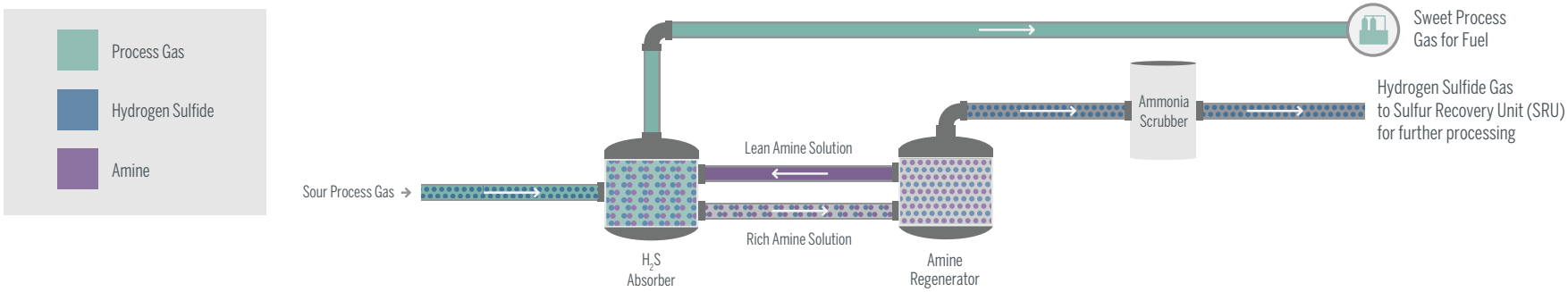
The H_2S absorber produces a liquid consisting of a mixture of H_2S and DEA, which is then piped to an "amine regenerator." The amine regenerator is a vessel where a lower pressure plus heat added by a steam reboiler "flashes" off the H_2S. In the amine regenerator, the H_2S is stripped from the DEA. The DEA is recycled to be used again, and the H_2S gas (no longer containing hydrogen, hydrocarbons, or DEA) is then sent to a sulfur recovery unit, as described below (see Figure A3-11, *Amine Treatment Process)*.

3.4.6 Sulfur Recovery Units Convert Hydrogen Sulfide H_2S Gas into Usable Elemental Sulfur

The separated H_2S stream is sent from the amine regenerator to one of three sulfur recovery units, where it is turned into elemental sulfur, using a process known as the "claus process" as depicted in Figure A3-12, *Sulfur Recovery Process*, below. Some H_2S is burned or oxidized in a furnace, creating sulfur dioxide (SO_2) from the H_2S ($H_2S + ½O_2 = SO_2 + H_2O$). The SO_2 produced further reacts with the unreacted H_2S to produce elemental sulfur ($H_2S+½SO_2=½S +H_2O$). The second step, which produces the elemental sulfur, occurs partially in the reactor furnace and partially in the catalytic reactors. The gases that exit the reactor furnace are routed to a heat exchanger where the elemental sulfur produced in the burner/furnace is condensed and sent to storage. The heat exchanger produces steam for use in the Facility. The gases from the heat exchanger are sent to a vessel that contains a catalyst to continue the conversion of the H_2S to elemental sulfur. The process at the Facility has two conversion stages to produce the majority of the elemental sulfur. The process gas that still contains unconverted H_2S is routed to the equipment called the Wellman-Lord tail gas recovery units, where remaining H_2S is oxidized to SO_2 and returned to the catalytic reactors for further conversion to elemental sulfur. The elemental sulfur that is produced is stored in a tank in a liquid form. It is shipped out of the Facility as a salable product in liquid form by truck.

Amine Treatment Process

An amine solution treats process gases containing hydrogen sulfide (sour gases) generated in the Facility's processing units. The treated gas is used within the Facility as a fuel source and the removed hydrogen sulfide is further treated into an elemental sulfur product.



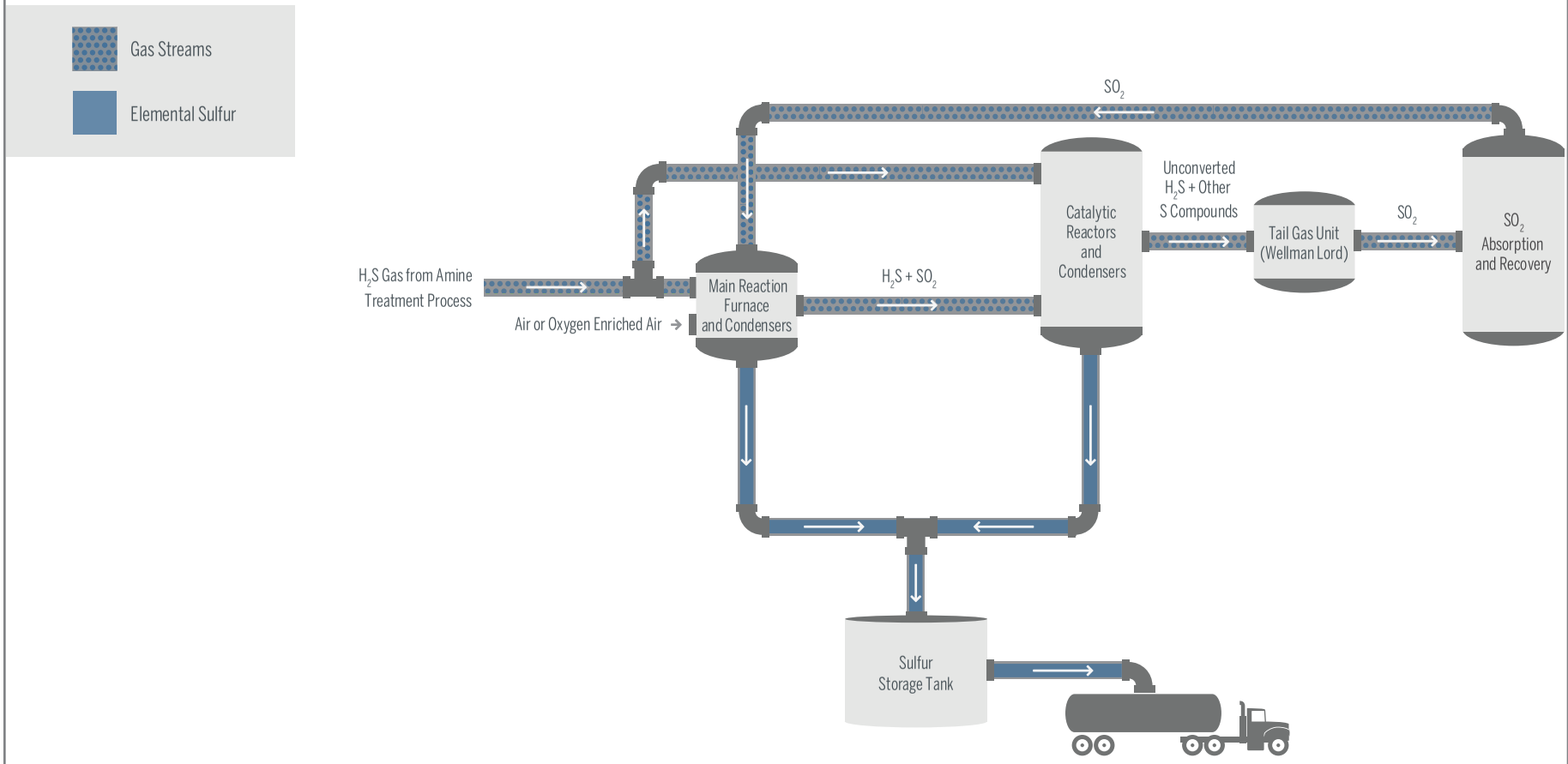
03.04.2014 P:\11-005 CVRN\PRODUCTS\DEIR\Figures\Appx B_Refinery 101\Draft\CVRN Figure A3-11.pdf

Source: Chevron (T39r2)

Figure A3-11
Chevron Refinery Modernization Project EIR
Amine Treatment Process

Sulfur Recovery Unit

The Sulfur Recovery Unit (SRU) recovers elemental sulfur from gas containing hydrogen sulfide. The elemental sulfur leaves the refinery as a salable product.



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Source: Chevron (T39r)

Figure A3-12
Chevron Refinery Modernization Project EIR
Sulfur Recovery Process

3.4.7 Conversion: "Cracking" Remaining Heavy Hydrocarbon Molecules into Light Hydrocarbons

After hydrotreating to remove natural impurities including sulfur, many of the crude oil fractions processed by the Facility are suitable for *Blending* prior to sale as products (e.g., gasoline, diesel, jet fuel), or are ready to be blended into specialty products (e.g., lubricating base oils).

However, gas oil fractions must undergo an additional refining process—thermally or chemically "cracking" the long chains of hydrocarbon molecules that comprise these hydrocarbon fractions—to produce gasoline, diesel, and other high-demand petroleum products.

The Facility uses two types of "cracking" technology: catalytic cracking and hydrocracking.

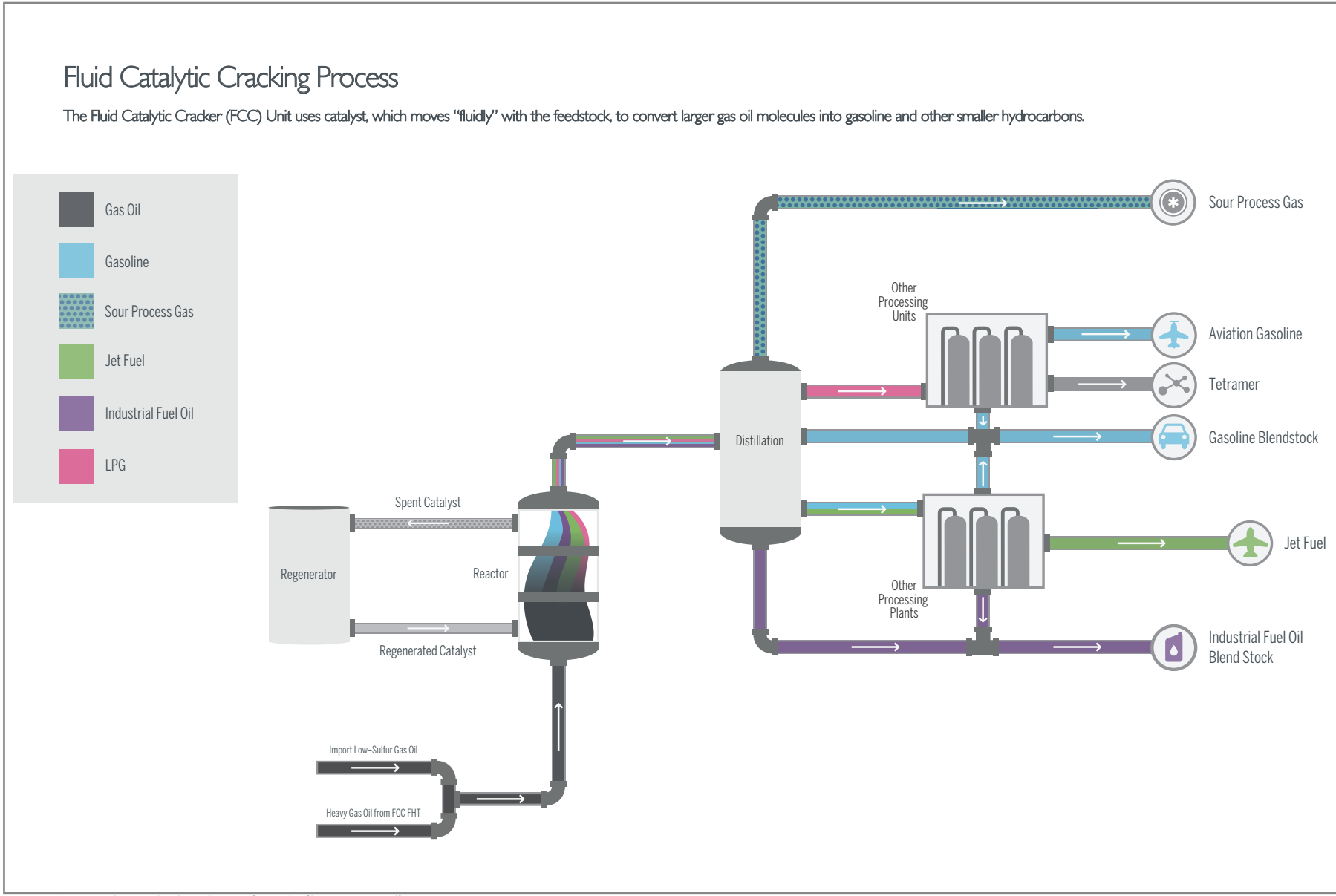
3.4.8 Catalytic Cracking

The Facility's fluid catalytic cracking unit is the fluid catalytic cracker. Catalytic cracking, or "cat cracking," involves heating gas oil fractions to temperatures of around 1,000°F when exposed to a "catalyst" at relatively low pressures (20 to 30 pounds per square inch [psi]) to "crack" the long chain hydrocarbon molecules into shorter chains, and thereby produce lighter hydrocarbons like gasoline. When the long-chain molecules of heated gas oil come into contact with the surface of the catalyst in this chamber, the molecular chains "crack" and become multiple, shorter-chained, lighter hydrocarbon molecules (see Figure A3-13, *Fluid Catalytic Cracking Process*).

The catalyst in the fluid catalytic cracker itself is a chemical compound with the appearance of a very fine powder. Although it comes into contact with the gas oil, the catalyst remains chemically unchanged and can be used again and again. The Facility's catalytic cracker is called a "fluid catalytic cracker" because the reaction takes place in a vessel where the catalyst particles behave like a liquid.

As the hydrocarbons crack, some of the carbon atoms from the cracked hydrocarbons deposit on the surface of the catalyst, which reduces the catalyst's ability to promote chemical reactions. (This deposit of carbon is often called "coking".) To regenerate the catalyst, air is mixed with the catalyst in a heated environment, and a chemical reaction – the oxidation of coke (essentially burning) – takes place that removes the coke from the catalyst and allows it to be reused.

The fluid catalytic cracker unit receives gas oil from (1) the hydrotreatment process described above, which removes sulfur and other natural impurities; and (2) imported



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Source: Chevron (T39r2)

Figure A3-13
Chevron Refinery Modernization Project EIR
Fluid Catalytic Cracking Process

purchased gas oil to the extent that it is already low in sulfur and thus does not require hydrotreatment.

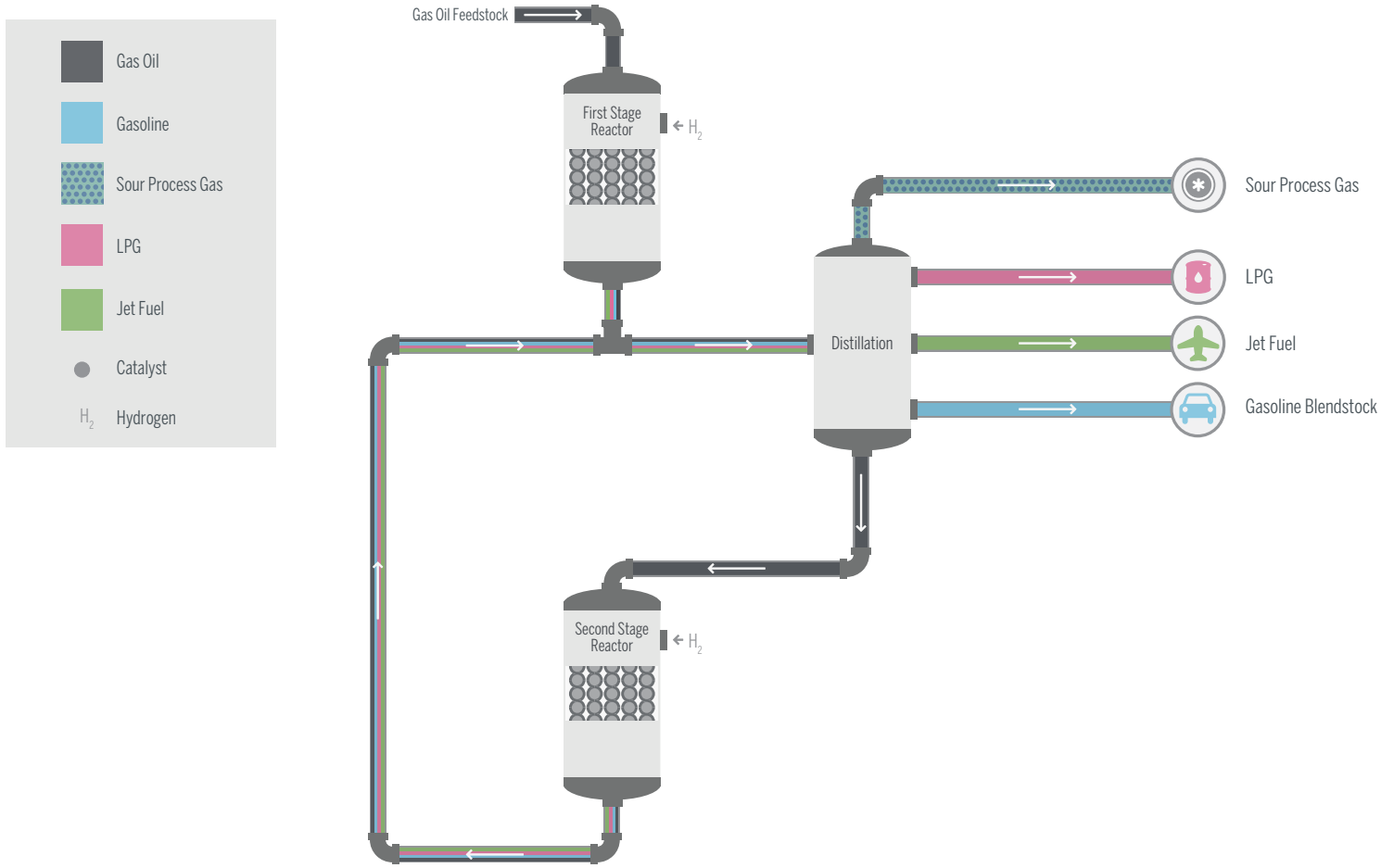
3.4.9 Hydrocracking (TKN Isomax Unit)

The second method of cracking used at the Facility, *hydrocracking*, involves chemical reactions between hydrogen gas and hydrocarbons in the presence of a catalyst, and occurs in a vessel operated at very high pressures on the order of 1,000 to 3,000 psi. The Facility's hydrocracker is called a "TKN Isomax." Hydrocracking converts gas oil into lighter hydrocarbon fractions. Unlike cat cracking, hydrocracking does not produce significant coke because it adds hydrogen atoms to the cracked molecules instead of releasing carbon atoms. (Hydrogen is used in the TKN Isomax unit in this cracking process and is an example of a refinery process where hydrogen is used in a manner that is unrelated to sulfur.) See Figure A3-14, *The Hydrocracker Process.*

The hydrocracking in the Facility's TKN Isomax unit is a two-stage process that removes impurities from gas oil in the first stage and then "cracks" the gas oil in the second stage. The first stage is called the TKN (Taylor Katalytic DeNitrification). The second stage is called the Isomax. The name of the combined TKN Isomax is typically shortened to just "TKN" because essentially all of the material fed to the TKN is subsequently fed to the Isomax. The TKN unit receives the lighter gas oils produced by the crude unit and treats it to remove impurities, similar to the FCC FHT, which treats the heavier gas oils. The treated gas oil flows from the TKN to the Isomax where the gas oil is cracked into gasoline, jet fuel, and diesel.

The TKN *Treatment* stage removes impurities in a similar fashion as the hydrotreaters. Catalyst, temperature, pressure, and time remove the impurities and hydrogen reacts with sulfur, nitrogen, and hydrogen-deficient hydrocarbons producing H_2S gas and ammonia. As with hydrotreaters, the H_2S produced by the TKN is absorbed in a H_2S absorber by a DEA solvent for further treatment and recovery of elemental sulfur product through the amine regenerators and ultimately the sulfur recovery units. The TKN unit operates at temperatures and pressures that allow the sulfur and nitrogen in the gas oil feed to be converted to H_2S and ammonia for eventual recovery as either salable sulfur or ammonia product.

In the hydrocracking (Isomax) stage, a catalytic reaction in the presence of hydrogen cracks the bigger gas oil molecules into smaller gasoline, jet fuel, and diesel molecules. Since both units use hydrogen, there is some incidental cracking in the TKN and there is some incidental removal of impurities in the Isomax.



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Source: Chevron (T39r2)

Figure A3-14
Chevron Refinery Modernization Project EIR
The Hydrocracker Process

Neither catalytic cracking nor hydrocracking creates or destroys hydrogen, carbon, nor any other atom. As larger hydrocarbon molecules are broken, they create larger numbers of smaller molecules. Those smaller molecules have the same molecular weight as the sum of the initial larger molecule plus the very light hydrogen gas, but the smaller molecules collectively take up more space (or volume) than the initial, larger, more dense molecule from which they were created. This expansion of volume through the hydrocracking process is called "processing gain" and it results in production (by volume) of slightly more hydrocarbon lighter end products than the volume of gas oil introduced to hydrocracker units. U.S. refinery processing gain averaged about 6.2% from 1996 through 2010. In 2012, about 44.98 gallons of refined products were produced for every 42 gallon barrel of oil input into U.S. refineries.

3.4.10 Reforming: Increasing Octane Levels in Gasoline

Reforming is a process primarily designed to increase the "octane" of gasoline. Octane is a characteristic of gasoline related to the tendency to "self-ignite" under pressure.[9] Engines are rated based on their ability to run lower- or higher-octane gasolines. High-performance engines generally need higher-octane gasoline. If the octane level in the gasoline is not suitable for the engine, premature ignition of the gasoline occurs in the cylinder—a condition known as "engine knock" because of the knocking sound that is made when the gasoline ignites too early in the engine's compression stroke. Octane ratings in commercial gasoline range from about 85 anti-knock index (AKI) in regular gasoline in high altitudes like Denver, Colorado, to over 100 for aviation gasoline.

Severe knock causes severe engine damage, such as broken connecting rods, melted pistons, and melted or broken valves and other components. An octane rating is a measure of how likely a gasoline or liquid petroleum fuel is to self-ignite. The higher the number, the less likely an engine is to pre-ignite and suffer damage. California allows a range of octane levels at the pump (87, 89, and 91), and buyers can choose the octane level that is appropriate for their car and budget. Higher octane ratings are typically recommended for higher-performance engines, and higher octane levels also cost more per gallon at the retail level than lower octane levels.

The "reforming" process in the Facility takes hydrocarbons that are in the naphtha weight range but have low octane and changes their molecular structure into higher-octane gasoline molecules. The reforming process involves reshaping because the naphtha has the same number of carbon atoms before and after this

[9] Octane is also a name for some hydrocarbons that include eight carbon atoms.

part of the refinery process, but the molecules are "reshaped" into higher-octane gasoline molecules. This reshaping of molecules also releases hydrogen, which is then used in other Facility processes as part of the Facility's overall hydrogen supply.

The Facility has two catalytic reformer process units (#4 and #5 Rheniformer), each of which consists of four separate catalytic reactors. As with other refinery processes using catalysts, each of these reactors consists of a chamber containing the catalyst material, operated at controlled temperature and pressure levels. Naphtha from the naphtha hydrotreater (which removed sulfur from this naphtha hydrocarbon fraction) is fed through each reactor chamber in series. The feed is treated with perchloroethylene, a chemical that provides chloride atoms to control reforming catalyst activity.

The products of reforming are light gases and a high-octane gasoline component typically called reformate. Hydrogen gas, a by-product generated in this process, is recovered and used in other Facility processes. The light ends produced at the reformer are used in gasoline blending (normal butane), alkylation unit (iso-butane), liquefied petroleum gas (propane) or refinery fuel gas (methane or CH_4). The reformers at the Facility are "semi-regenerative," which means that they accumulate coke as hydrocarbons are passed over them and a small amount of cracking occurs. This coke must be burned off periodically, which is called "regeneration." The frequency of the regeneration depends on the octane level achieved for the reformate. Higher octane results in more frequent regeneration. Typical regeneration cycles are every 6 to 24 months and regeneration only takes a few days, unless significant other work is required on the unit.

3.4.11 Specialty Operations: Lubricating Base Oil Production Process

The Facility is also a major national producer of industrial lubricant base oils. This requires a specialty process consisting of gas oil hydrocracking. Gas oil from the crude unit is routed to the lube unit crackers. These are similar in operation to the FCC FHT, but instead of producing a primary output of gas oil for use in the fluid catalytic cracker, they produce material used as input to the lube hydrofinishers. The lube hydrofinishers also use hydrogen to treat this material and ultimately produce a base oil that is the primary building block in producing lubrication oil with the desired physical properties such as viscosity and density.

The base oil production process includes sulfur removal from the feed. The sulfur removal process is the same as the other hydrotreating units. Lighter ends that include H_2S produced in the lube crackers are directed to a H_2S absorber to

remove the H_2S by absorption in DEA. The H_2S rich DEA is regenerated in an amine regenerator and the H_2S is changed to elemental sulfur in the sulfur recovery unit.

3.4.12 Blending and Final Product Production Process

The Facility processes produce hydrocarbon fractions that are products ready for shipment, and it also produces hydrocarbon fractions that require blending with other hydrocarbon fractions before being ready for shipment as products. *Blending* typically occurs when hydrocarbon fractions are piped to a tank in specific quantities until required product specifications are achieved. All of the Facility's hydrocarbon products are produced either by one or more of the refinery process steps described above, or by blending hydrocarbons produced by one of the refinery process steps described above. How much of any particular product is produced varies based on market factors, but the Facility has consistently served as a primary supplier of gasoline, jet fuel, and base oils in the region.

3.5 OTHER REFINING PROCESS OPERATIONS

The Facility also includes other major equipment and activities that are integral to Refinery Operations but not technically part of the Facility's process for producing products. Other major categories of Refinery Operations described in this section include the Facility's hydrogen plant, furnaces, flaring system, power plant, wastewater treatment plants, and storage tanks.

3.5.1 Hydrogen Plant

As described above, hydrogen plays a critical role in the refinery process steps described above, including in the catalytic processes for removing sulfur in the *Treatment* processes, breaking bonds and forming new bonds in the *Cracking* processes, and the production of lubricant base oils. Hydrogen gas is produced on-site in an existing hydrogen plant as well as from the *Reshaping* process.

3.5.2 Hydrogen Manufacturing Technology

The current hydrogen plant produces hydrogen from a process known as “steam reforming.” The chemistry of the existing plant is relatively simple. Water (H_2O) is combined with methane (CH_4, the primary component of natural gas) which, through a chemical reaction, produces hydrogen, carbon dioxide (CO_2), and carbon monoxide (CO). This steam reforming reaction is typically carried out using a nickel catalyst, which is packed into tubes of a reforming furnace.

In the mid-1980s, PSA generally replaced the older technology (Meyers, 2004). As explained further below, the primary difference between the two processes is that the final product from the steam reforming process described in the prior

paragraph (about 94% pure hydrogen) goes through an additional step in the newer technology in which it is sent to PSA vessel units, where the hydrogen is selectively absorbed at high pressure, leaving the impurities like CO_2 behind. The absorption mixture is depressured, and very pure (99%) hydrogen is all that is left. The impurities and some hydrogen left in the PSA units are burned in the furnace to provide heat for the reaction.

3.5.3 Furnaces, Burners, Heat Exchangers and Thermal Oxidizers

Heating devices provide heat to various liquid or gas streams such as water, process streams (e.g., crude oil), or air. In general, these heating devices are referred to as "furnaces." Sometimes, heating devices are given special names based on the stream being heated. For example, a heating device that boils water is commonly referred to as a "boiler." A heating device that provides heat to non-water liquid streams is sometimes also referred to as a "process heater." However, the general operation and the emissions associated with each are similar in concept.

These heating devices all include burner assemblies. The burners are where fuel (i.e., natural gas or refinery fuel gas) is combusted with oxygen to form a flame and hot combustion gases. (This is a larger scale version of the burners that one would find on a natural gas kitchen stove.) There are different ways a hydrocarbon stream may be heated during the refining process, depending on the configuration of the heating device and the technology of the refining process that the heating device serves. For example, a hydrocarbon stream being heated may pass through tubes that are surrounded by the hot combustion gas. In this case, the heat from the hot combustion gas transfers through the tube, increasing the temperature of the hydrocarbon stream within the tube. The flame component of the heating device may also be near the hydrocarbon stream, which would directly transfer additional radiant heat to the stream through the tubes.

In certain process units, burners are used to directly combust a refinery process stream (i.e., the material being processed through the Facility unit comes into direct contact with the flame from the burner) instead of using burners just as heaters. This occurs, for example, when hydrogen sulfide gas is combusted as part of the sulfur recovery unit process in the *Treatment* process for sulfur removal.

In addition, some burners are designed to combust volatile organic compounds (VOCs) in exhaust streams or fugitive emissions, converting the VOCs into CO_2 and water. Such devices are called thermal oxidizers. Thermal oxidizers are used, for example, to control VOC emissions from pumps and compressor seals at the Facility.

The combustion process for all heaters produces air emissions. The pollutants produced depend on the chemical composition of the fuel and combustion air and can include criteria air pollutants, toxic air contaminants, and greenhouse gases. The design of the device can influence the extent to which air emissions are generated. For example, low-NO_x burners are designed to reduce NO_x formation by controlling fuel and air mixing. Air emissions from burners are described in *Section 4.3, Air Quality*, and *Section 4.8, Greenhouse Gases*.

The combustion gas from a heating device typically remains hot even after transferring heat to the material being refined in the part of the refinery process served by the heating device. This combustion gas can be released as exhaust through a flue stack (subject to required air pollutant controls), or an "economizer" can be used to recover heat from the exhaust gas that would otherwise be released into the atmosphere. The recovered heat can be reused in the refining process to pre-heat a process stream or combustion air, which then results in lower fuel consumption because less fuel is used to bring the stream or combustion air up to operating temperature. An economizer is essentially a "heat exchanger" (described below) that reduces fuel consumption from the same device from which it derives its waste heat. The waste heat from the combustion gas could also be used to heat other streams derived from other units in a conventional heat exchanger.

A "heat exchanger" is a piece of equipment whereby a hotter process stream transfers heat to a cooler process stream. The two process streams do not come into direct contact with each other (i.e., they are not mixed). Rather, they are generally separated by a metal wall that conducts the heat from one stream to another. Heat exchangers are designed such that the surface area of the wall separating the two streams is maximized in order to maximize the amount of heat transferred. There are no emissions associated with heat exchangers because there is no combustion occurring. For example, the hot gases that exit the sulfur recovery unit enter into a heat exchanger where it transfers heat to a stream of water, converting the water to steam.

3.5.4 Flares

A refinery moves raw materials through a network of pipes and processing equipment. As described above, many of the refining processes involve using pressure and/or heat to change hydrocarbons and transporting heated or pressurized hydrocarbons through the different parts of a refinery. Flare systems are designed to provide for the safe disposal of hydrocarbons that are either automatically vented or manually drawn from process units at refineries. Hydrocarbons must be controlled in a safe and effective manner in the event of an operational upset. Flare systems gather vented gases and combust them to prevent releases of hydrocarbons directly into the atmosphere.

Flaring plays a critical safety role in refinery operations. A "flare" is usually a tall stack equipped with burner equipment that is designed to ignite hydrocarbon gas when it leaves the flare. This flare technology is designed to very quickly and very efficiently consume hydrocarbon gas (similar to a gas stove), with minimal air pollution. The primary function of the flaring system is to relieve pressure to prevent units from overpressure. Flares are primarily used for burning off flammable gas released by a "relief gas header" during either unplanned pressuring of refinery equipment, or during startups and shutdowns. A header for collection of vapor streams is included as an essential element of nearly every refinery process unit. At the Facility, these are typically referred to as "relief gas headers," since the system, which is generally at near-atmospheric pressure conditions, receives gases "relieved" from higher pressure operations within the unit.

The primary function of the relief gas header is safety. It provides the process unit with a readily available and controlled means of releasing gases to prevent over-pressurization of equipment (routing them to controlled locations for destruction by combustion). It also provides a controlled outlet for any excess vapor flow, nearly all of which is flammable and can be sent to a flare to be burned off, making it an essential safety feature of every refinery. Each relief gas header has connections for equipment depressurization and purging related to maintenance turnaround, startup, and shutdown, as well as pressure relief devices and other safety control valves to handle upsets, malfunctions, and emergency releases.

The Bay Area Air Quality Management District (BAAQMD) has been a global leader in regulating the use of flares. Flaring is not required to operate a refinery's process units during normal operation, and the need for flaring at the Facility has been substantially reduced over time.

The Facility has identified situations or activities likely to cause flaring, including releasing gases to prevent equipment from becoming over pressured, as described below in more detail. Releases of relief gas to the flare result from an imbalance between the quantity of vent gas produced by the Facility and the rate at which it can be compressed, treated to remove contaminants (sulfur compounds), and utilized as fuel gas. Situations that can lead to flaring can be grouped together based on similarity of cause. At the Facility, flares are used for three primary purposes:

- **Process unit startups and shutdowns and planned maintenance.** To prepare an individual equipment item or a block of refinery equipment for maintenance, it is necessary to isolate it from active operations and clear it of process fluids. Examples include unit shutdowns, working on equipment

and/or relief systems, catalyst change, plant leak repairs, and compressor maintenance or repairs. In order to avoid flaring, there must be a balance between producing and consuming fuel gas units. When either a block of equipment or an individual equipment item is removed from service, if it either produces relief gases or consumes fuel gases, then the balance of the fuel gas system is changed and adjustments are necessary to bring the system back into balance. If the net change in gas production or consumption is large and the adjustments in the rate at which gas is produced or consumed by other units cannot be made quickly enough, then flaring results.

- **Upset/malfunction.** An imbalance in the flare gas system can also result from upsets or equipment malfunctions that either increase the volume of flare gas produced or decrease the ability of the fuel gas handling system to accommodate it. Examples include relief valves lifting, pressure relief valve malfunction, equipment overpressure, loss of a utility system, and loss of air fins or condensers.
- **Emergency relief.** Pursuant to BAAQMD Regulation 12, Rule 12, Section 201, an emergency "is a condition at a petroleum refinery beyond the reasonable control of the owner or operator requiring immediate corrective action to restore normal and safe operation that is caused by a sudden, infrequent and not reasonably preventable equipment failure, natural disaster, act of war or terrorism or external power curtailment, excluding power curtailment due to an interruptible power service agreement from a utility."

To address these situations, the Facili**ty** currently operates two flare gas systems, complete with flare gas recovery systems, one covering the "north yard" of the Facility and the other covering the "south yard."

The operation of the Facility's flare systems is governed by its flare management plan (FMP) submitted pursuant to the requirements of BAAQMD Regulation 12, Rule 12 (Reg. 12-12). The purpose of this rule is to reduce emissions from flares at petroleum refineries by minimizing the frequency and magnitude of flaring. Flaring is prohibited unless it is consistent with an approved FMP. Each refinery is required to submit a FMP annual update. The FMP defines a series of measures intended to reduce flaring to the extent that is feasible without compromising safety and necessary refinery operations and practices. It is the Facility's policy that flare events would only occur within the scope of Reg. 12-12, and it would adjust the operation of process units or implement corrective action to prevent flaring in accordance with the regulation.

3.5.5 Power and Steam Generation, Including Boilers

The Facility is designed to generate on-site most of the power it needs to operate. During the baseline period of 2008-2010, the Facility imported an annual average of only 2 megawatts (MW) of electricity, compared to a total annual average of approximately 115 MW of electricity used by the Facility.

Electric power is generated at the Facility by two gas turbines, one steam turbine generator, and the fluid catalytic cracker power recovery system. The gas turbines generate electricity through the combustion of fuel which moves the blades of a turbine, providing mechanical power to operate the electric generator.

A steam turbine generator creates electricity when higher pressure steam is reduced to lower pressure steam, resulting in mechanical power to operate the electric generator. Steam is produced by two heat recovery steam generators at the co-generation unit as well as five fired boilers in the "No. 1 Power Plant."[10] (The combination of the gas turbines, the heat recovery steam generators, and the duct burners comprise the co-generation facility.)

Steam is also generated by process units throughout the Facility. For example, steam is generated in a heat exchanger that takes in hot gases from the sulfur recovery unit, transfers the heat to a water stream, and converts that water to steam. In addition to being used to generate electricity in the steam turbine generator, steam is also piped throughout the Facility and is injected into various processing equipment to be used for heating in the refining process (similar to radiator heat in a house) or for direct contact with hydrocarbons during the refining process.

The Facility uses approximately 2.5 million pounds of steam per hour. However, the boilers in the No. 1 Power Plant generate only about 10% of that amount; the remaining steam is produced by refinery processes.

3.5.6 Cooling Towers

Process streams require cooling that is usually provided by water in a heat exchanger. Water that picks up heat in the process is sent to a cooling tower where the water is dispersed into thin streams through which air is passed. The

[10] The five boilers are called the "No. 1 Power Plant" because the unit was built in the 1930s and used to generate electricity. However, "power plant" is a misnomer as the unit today consists of boilers only and generates only steam, not electricity.

air evaporates a small amount of the water and the evaporation cools down the water, which is then pumped back to the heat exchanger again for reuse.

3.5.7 Water Use and Treatment

The refining process results in industrial wastewater that is treated in a wastewater treatment facility. The Facility's process wastewater and most of the stormwater runoff is collected and managed in the Facility's existing industrial wastewater treatment system that is regulated by the RWQCB.

3.5.8 Storage Tanks

The Facility currently operates approximately 160 aboveground storage tanks (including pressurized spheres) containing raw materials, feedstocks, intermediate material, and final products. There is a number of small/axillary tanks located throughout the Project site that are not part of the primary Refinery Operations processes.

Most tanks store raw feedstocks (crude oil and gas oil), intermediate stocks, or finished products (gasoline, diesel, jet fuel, etc.). These tanks are located in areas of the Facility known as the Refinery Process and Tank Farm areas (see *Figure 3-2* in *Chapter 3, Project Description*). Furthermore, some tanks store chemicals that are involved in Refinery Operations but are neither feedstocks nor product, such as perchloroethylene used in the reforming process.

The tanks range in capacity from under 1,000 barrels to over 650,000 barrels. Over long periods of time (e.g., annually) the average amount of material stored in tanks is approximately constant, but the quantity of material flowing through the tanks on any given day increases or decreases as the feedstock tanks are emptied into the Facility (or product is produced by the Facility feed rate and production volumes change).

3.5.9 Pipelines, Valves, Pumps, and Flanges

The Facility has a complex network of pipelines, and the pipelines have process components that each result in small emissions of hydrocarbons from the seals in the process components. These process components include approximately 5,000 miles of pipe, 105,000 valves (including pressure relief devices), 1,400 pumps and compressors, and 400,000 connectors such as flanges (which are used to connect two lengths of pipe).

3.6 REFERENCES—APPENDIX 3

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Major Accidents at Chemical/Refinery Plants

in Contra Costa County

Company Date Accident Occurred	Accident Description	Onsite Impact	Offsite Impact
Chevron August 6, 2012	# 4 Crude Unit Fire. An 8″ line from the atmospheric distillation column with hot diesel like material leaked and caught fire.	5 Chevron emergency responders were treated for minor burns, and received first aid.	More than 15,000 people sought medical attention.
Phillips 66 June 15, 2012	A sour water tank (T-294) was overpressured resulting in a split in the top seam of the fixed roof tank. Vapors left the tank through the opening until it could be sealed. Chemicals involved included H2S, other sulfur	Atmospheric tank T-294 was overpressured resulting in a rupture along approximately 20 feet of the top seam of the roof. The rupture allowed vapors from the tank to exit into the surrounding area. H2S was	Strong sulfur odors were detected by Hazmat IR personnel on Friday in areas from I-80 and the surrounding communities. The highest readings were approximately 1 ppm (as H2S) on I-80, which is a few hundred feet from the storage tank. Readings from 5-20 pp

		compounds, natural gas, light hydroca	one of the chemicals detected onsite although ma	
	Tesoro Golden Eagle Refinery December 9, 2010	Partial Power outage due to damage at substation led to excess flaring and some unit shut down. CWS 2 activated at 10:31. CCHMP monitored the surrounding area and no hazardous substance was detected. Incident downgraded to CWS 0 at 13:18.	Plant-wide partial power due to fire and later explosion at Switching Station #7.	Significant flaring due to loss of power to mulitple units.
	Tesoro Golden Eagle Refinery November 10, 2010	Power outage from 3rd party power and steam supplier led to excess flaring and refinery-wide shutdown, very dark smoky plume. At 16:14, CWS 2 and at 16:45 upgraded to CWS 3. CCHMP monitored the surrounding area and took air samples. No	Complete refinery shutdown, and a grass fire around the flare.	Visible smoke and reports of burnt grass smell in N. Concord.

		hazardous substance was detected.		
	ConocoPhillips October 22, 2010	Third party (Air Liquide) hydrogen plant tripped resulting in elevated pressue in the Refinery's fuel gas system, and decreases in available hydrogen and steam to the Refinery. One turbine at the Refinery power plant immediately tripped further reducing a	Overpressured fuel gas system resulted in flaring. Loss of steam and hydrogen resulted in a slow down of some units. Power plant turbined tripped off resulted in smokey flare and further slow down of select operations. No equipment damage was reported.	The BAAQMD received a number of complaints of visible smoke and odor in the area. No contaminants were found in community air samples taken by Refinery personnel. No activity was seen on the Refinery's fenceline monitor.
	Tesoro Golden Eagle Refinery October 10, 2010	At 12:20, fire on Tank 650 (foul water), contractor was replacing seal. Tank has a 3' diesel to layer for odor control. One Contractor treated for smake inhalation, released same day. No odor reported. All clear at 16:10.	Emergency Operation Center was activated. No reportable quantities of hazardous compounds were exceeded.	visible smoke plume, but air monitoring by Tesoro industrial hygiene yielded non-detect levels.
	Reactions	A brass valve was	The loss of	Toluene vent

Reactions Products May 5, 2008	A brass valve was removed from a bottom of a storage tank partially filled with toluene. The removal looked ot be a theft of the valve over a weekend when no one was at the facility. Over 3,000 gallons of toluene was released. The spill went offsite into a ditch that run through the wetlands between Parchester Village and the Bay. The release was found on Monday morning and the US Coast Guard responded and requested that a shelter-in-place be called. The Parchester siren was sounded and information went out over the media to notify the residents of the shelter-in-place.When Health Services Hazardous Materials Response Team arrived onsite	The loss of over 3,000 gallons of toluene.	Toluene went offsite into the wetlands. The toluene was in a ditch that runs along the border of Parchester Village. Toluene odors were noticeable in the Parchester Village. Siren was sounded and the residents of Parchester Village were requested to shelter-in-place.	

	arrived offsite and took measurements of the amount of toluene in the air, the shelter-in-place was lifted. Health Hazardous Materials Programs is classifying this incident as a Community Warning System Level II and a Major Chemical Accident or Release Severity Level II, because if the toluene ignited the damage and consequences of the incident would be major.		
Calpine Los Moedanos Energy Center May 24, 2007	While overseeing the unloading of a bulk delivery of corrosion inhibitor, approximately 300 gallons of Nalco Trasar 3DT177 (phosphoric acid) was inadvertently unloaded into a storage tank containing about 378 gallons of 12.5% Sodium Hypochlorite	The incident resulted in a chlorine gas release in which the Field Operator and two other plant employees were exposed to. The three plant employees inhaled chlorine gas resulting in throat irritation and	Shelter-in-place was declared for the area north of the Los Medanos Energy Center for about an hour. No offsite complaints were received. CCHS Hazardous Materials Response Team conducted air monitoring outside of the affected building with the highest level of chlorine at 0.15 ppm. Air sampling conducted at

			hypochlorite solution. The chemical reaction of the two products resulted in a chlorine gas release in which the Field Operator and two other plant employees were exposed to. The three employees were transported via ambulance to the Mt. Diablo Medical Center for observation. Time of injury was reported to be 8:30 a.m.	irritation and minor chest pains. Three plant employees transported to Mt. Diablo Medical Center for observation. Symptoms identified as moderate throat irritation for all three employees and one of the employees complained of tightness in the chest. The emergency response team (consisting of local fire, police, paramedics, and the County HAZMAT team) isolated plant entry and perimeter access, removed non-essential personnel off-site, and notified neighboring plants. The facility flushed the neutralized	conducted at various locations of the plant perimeter indicated non-detect.

		contaminated tank contents to the cooling tower and ventilated affected building.	
ConocoPhillips March 18, 2007	Sulphur plant shutdown due to electrical failure. XS sulfur to flare.	Haze in flare plume.	No complaints were received from the community.
Chevron Richmond Refinery January 15, 2007	"At 5:33 Chevron upgrades incident to Level 3 and sent message that there was a fire at the #4 Crude unit. Initial notification was 5:23 for a Level 2. Operators were in the process of shutting down the plant in preparation for scheduled maintenance. - Information About the Chevron January 15 Fire	Fire near Vacuum column bottoms pump. One employee was treated for minor burns and released to return to work on the same day. Another employee received on-site treatment for minor skin irritation.	Sirens were sounded and TENS Zone 3 & 4 was activated. Unknown amount of hydrocarbons was combusted, resulting in a release of sulfur dioxide. Air monitoring did not indicate adverse air quality impacts.
General Chemical - Richmond June 23, 2006	The main turbine tripped and the shutdown interlock on the combustion air blower did not work correctly, so the blower pressured up the upstream side of the system which is normally under a vacuum.	The plant shut down.	Four Chevron employees were exposed. No other public appears to be affected. Wind at the time of the release was blowing towards Chevron.
ConocoPhillips May 1, 2006	Cogeneration Turbine "C" trippped off. The electrical systems powered from the	Some units shutdown	Smokey Flare for about 10 to 15 minutes

		generator lost power resulting in the shutdown of some units including the wet gas recovery compressor which is believed to have resulted in liquid to the flare system which caused the flare gas recovery compressor to shutdown which resulted in the flaring event. The steam system slumped due to the loss of the "C" turbine which resulted in lower that desired steam to the flare tip resulting in some incomplete combustion or a "smokey" flare.		
Shell Oil Products U.S Martinez Refinery March 26, 2006		At 4:15pm, on Sunday 3/26/06, Shell Martinez Refinery reported via the Community Warning System a release of sulfur dioxide gas from the stack of Sulfur Recovery Plant #3 (SRU#3). Community Warning System sirens were sounded. Shell identified the release as a Shelter-in-Place because a visible plume was seen drifting across Shell Avenue and facility personnel at the time believed the plume could pose a health	Shutdown SRU#3 briefly to assess for damage, found none, then returned to normal operation. Refinery officials did not report any injuries associated with this event. Refinery officials did not report any visible external damage to equipment. There may have been elevated temperatures in one of the catalyst beds that resulted in producing sulfur	Visible plume released from SRU#3 stack. Level 3 called with sirens and TENS activated. Pluming stopped in 15 minutes. Following the notification, Hazardous Materials Program staff responded to the incident within ten minutes by assessing the area around the refinery. Hand held monitoring equipment did not detect any sulfur dioxide or hydrogen sulfide. A slight sulfur dioxide odor was detected at Shell Avenue and Marina Vista. Feed to the process was shut off which quickly

		hazard. . TENS zones 3 and 2 were activated.Visible pluming stopped within 15 minutes. Shell Avenue was closed for 25 minutes. Shell downgraded the event to a CWS Level 0 within 40 minutes after the event started.	dioxide gas. CCHS Hazardous Materials did not receive word of any injuries or offsite impacts associated with this release.	stopped the visible pluming.
	Tesoro Golden Eagle Refinery March 24, 2006	Fire at #2 HDS at the F-20 furnace outlet piping at 15:38 hrs. Operations personnel shut down unit and activatd fire monitors on the unit.	Flange failure led to fire and unit shut down	No community complaints were received by BAAQMD
	Shell Oil Products U.S Martinez Refinery November 8, 2005	At the FCC Unit, a 1 to 2 foot diameter slurry filter was taken off line to clean the filter. While the maintenance team was in the process of placing the/a clean filter back in the filter unit or housing, they noticed a small leak through the block valve, which quickly became big, and one person was not able to vacate fast enough, the material jet was approximately 200 feet in the air. The event started on 11/8/05 at about 8:24 pm. It was downgraded to a level 0 at about 2:54 am on 11/9/05. The event took so	One contractor was sent to San Pablo Medical Center with 1st, 2nd, and 3rd degree burns on head on arm. No fire occurred. Some flaring occurred, Oil and catalyst slurry spray residue coated neighboring equipment and took days to clean up.	Oil/catalyst slurry mist coated vehicles and pavement southwest of the refinery. No offsite injuries reported. Approximately 150 gallons of total material was estimated to travel offsite. No hydrocarbon or H2S was observed in facility air samples. Some flaring occurred and resulted in estimates of 62.6 lbs SO2 and 0.9 lbs Nox from the flare system. Oil droplets were observed on cars and pavement southwest of the refinery.Approximately 3000 insurance claims from community members have been filed as of the 30-day report

	The event took so long to get under control because the liquid was hot, about 700F at 80 psig. 150 barrels of material was released and comprised of cat cracked slurry oil (heavy, dark oil) and lighter flushing oil (diesel type). Slurry oil comprised about 1% of total material.		report.
Tesoro Golden Eagle Refinery October 26, 2005	Partial power outage at the refinery around midnight and early morning hours, resulted in upset and flaring at the Chem Plant.	Power outage lead to ammonia recovery unit shutdown to reduce acid gas load to sulfur plant.	A plume from chemical plant stack was visible from off-site and potentially contained Sulfur Dioxide. Odor patrol from Tesoro was in the Clyde area and reported no odor impact. Ground Level Monitors did not detect any sulfur dioxide or hydrogen sulfide.
Tesoro Golden Eagle Refinery August 24, 2005	Lube oil fire from mini blower near the main blower at FCCU.	3665 pounds of lube oil est. to be combusted in the fire. No injuries.	Heavy smoke, one odor complaint from Bay Point.
General Chemical-Richmond July 26, 2005	A flow meter on a feed to the oleum stripper in the CP Plant developed a leak. The facility estimates that between 2 and 18 pounds of slfur trioxide were released.	The CP plant was shut down. The oleum flow was stopped within 3 minutes and the liberation of sulfur trioxide within 15 to 20 minutes.	Initially a level 1 called into agencies. A level 2 was called at the close of the event.
Tesoro Golden Eagle Refinery January 12, 2005	Visible emissions of steam and coke dust from No. 5 Boiler Stack due to	Boiler was shutdown.	Tesoro received 2 complaints from the community for the visible emission. Odor

January 12, 2005	Boiler stack due to tube failure.		visible emission. Odor patrol indicated theat there were no odors in the surrounding communities (Concord, Vine Hill, Benicia Bridge, and Martinez areas)
ConocoPhillips October 31, 2004	Plant 19, F-1 flare gas knockout drum line 14 inch flange was opened while process gases were flowing, instead of another flare line flange that emptied and suppose to be opened.	Release of process gases and plant emergency called.	Hydrogen sulfide and reduced sulfur compounds were released that caused strong odors downwind. Complaints about strong odors came from as fay away as Bay Point. Sirens were sounded and the residents of Crockett and Rodeo were asked to shelter-in-place.
Tesoro Golden Eagle Refinery October 30, 2004	No 5 boiler pluming during start-up of the coker unit after the turnaround.	Operational upset during coker start-up and ultimate shutdown.	Visible black plume, signigicant pluming of coke dust. Tesoro rec'd one complaint, BAAQMD rec'd five compliants.
Tesoro Golden Eagle Refinery October 14, 2004	Fire at a naphtha transfer pump at 2:45 A.M. At 5:30, the fire is no longer visible and at 6:27 CCHS declares the incident to be "all clear."	Fire response personnel were able to isolate tank from the pump.	Visible black plume, no odor complaints received by BAAQMD or CCHS. IH detected no chemicals of concern off-site.
Tesoro Golden Eagle Refinery September 16, 2004	Explosion and fire within Tank 745 at 12:03 A.M. The Tank contains sulfuric acid and a floating layer of alkylate. Fire was out at 6:56. CO2 was introduced to tank at 6:42.	Sulfuric acid recycling unit was shutdown.	50' to 100' flames, smoke plume straight up, no odor complaints received by BAAQMD or CCHS, one odor report received by Tesoro. IH detected no chemicals of concern off-site.
Tesoro Golden Eagle Refinery	#5 boiler developed an internal water	#5 boiler shutdown, coker	Visible black plume containing coke dust.

July 4, 2004	leak at app.1:42 p.m. and coker flue gas was then diverted directly to the stack.	and crude rate reduced.	
General Chemical Bay Point Works April 3, 2004	Fire at a storage hangar near packaging building. The fire involved several pallets of chemicals (hydrogen peroxide-30%, nitric acid-69%, ammonium hydroxide-29%, misc. etchants), cased in one-gallon bottles, several 55-gallon drums and 8-pallets of empty bottles.	Facility was evacuated.	A plume of smoke was visible for 1-2 hours. Community advisory notice was distributed but not shelter-in-place.
Tesoro Golden Eagle Refinery March 2, 2004	Odor complaints were received at the Golden Eagle Refinery and recognized in the Vine Hill area the evening of March 1. The refinery receive additional odor complaints on March 2. Hundreds of odor complaints were received from Bay Point, Pittsburg, Concord, Pleasant Hill, Walnut Creek, Alamo, Danville, San Ramon, Dublin, and Pleasant. The odors seemed to have originated from the Golden Eagle Refinery. Tesoro was unable to locate the source of the odors. The odors could have	No noticeable impact onsite.	Hundreds of odor complaints throughout Central and parts of East County from the north part of the County into Alameda County. The odors were consistent with reduced sulfur compounds. CCHS received information that people were feeling ill from the odors and at least case where a person past out.

	originated from some of the areas doing special operations. Tesoro shut down the operations and odors were no longer noticeable.		
Tesoro Golden Eagle Refinery February 20, 2004	Due to problems that occurred at the Foster Wheeler Cogeneration Facility, electrical power was lost at the Golden Eagle Refinery. The refinery shut down and depressured to the flare. This caused incomplete combustion of the flare and large amount of black smoke.	The refinery shut down due to the lack of power and sent large quantaties of hydrocarbons to the flares.	The flare smoking caused concerns to the community. The smoke in most part was going straight up with some smoke drifting over North Concord.
Chevron Richmond Technology Center September 16, 2003	Fire at the Tank field (Oronite Drum loading) at 12:41 p.m. While discharging gasoline from a tank truck to 55 gallon drums via a manifold system an ignition occurred in a partially filled drum. Flames quickly spread to the tops of adjacent drums and eventually caused the breach of several drums. It is reported that the Operator and Truck Driver activated the shutdown systems as they evacuated the area.	Heat blistered paint on one 60,000 gallon tank in the nearby tank farm area. $150,000 of product loss (400 gal) and equipment damage.	Black smoke until the fire was extinguished by CFD.
Chevron	North Isomax	Shutdown N	Odor complaint, 26

Chevron August 9, 2003	North Isomax plant hydrogen recycle compressor, K600 unexpectedly shut down resulted in flaring activity with visible smoke.	Shutdown N. Isomax.	Odor complaint, 20 persons sought medical attention at Richmond Kaiser.
Tesoro June 8, 2003	The #5 Boiler developed an internal water leak sufficient to compromise good boiler water level contro. #5 Boiler fuel (waste heat from coker) was then diverted directly to the stack, and #5 Boiler was shutdown. When this occurs coke fines go out the stack. Coke fines continued to go out of the stack from 2200 6/8 to 0600 hours 6/10. It is estimated that 3.4 tons of coke fines went to atmosphere.	The refinery is at reduced production, until the #5 boiler is brought back online or temporary boilers can come online.	Coke fines were sent to the atmosphere. Complaints of rotten egg and burnt match spells were received.
Shell Martinez Refinery January 11, 2003	The Flexicoker Unit had a small fire starting about 3pm on 1/11/03. The fire may have involved gas oil or a heavy oil stream. One of the Safety Supervisors thought the smoke was traveling off-site so the bumped it to a level 3, including sirens and a scroll across the TV. Wayne was told that the scroll did not work so well since it blacked out the	Small fire, smoke.	Smoke potentially traveling offsite. Level 3. Sirens sounded. TV warning message scrolled.

	football game, instead of just scrolling. Paul Andrews responded by telephone and was interviewed by the press. Wayne said that Paul informed the press that Shell conservatively went to a level 3. Shell started their incident investigation, including the RCA over the weekend. Art Kinney is leading the investigation.		
General Chemical-Richmond September 26, 2002	SO3 release from CP unit, control valve problem, prompting Level 2.	Unit shutdown.	Plume toward Chevron.
Phillips (now ConocoPhillips) Rodeo, CA July 10, 2002	The steam boilers were tripped off, which led to a loss of steam for the refinery. The refinery was shutdown immediately with much of the offgas going to the flares. The flares were overwhelmed and created a lot of smoke and decreased the overall efficiency of the flares.	The refinery lost steam and had an emergency shutdown.	Smoke, partial burned hydrocarbons, and sulfur compounds impacted the communities downwind. Tormey and Crockett were asked to shelter-in-place. Sirens and the CAN were activated.
Shell Martinez, CA April 23, 2002	Sulfur Recovery Unit #3 was being shut down on the morning of 4/23/02 to address concerns about SO2 stack	Shutdown SRU#3 pending outcome of investigation and completion of RCA.	Smoke released. Level 3 was called with sirens activated. CCHS identified that visible smoke plume stayed elevated and dissipated quickly

			SO2 stack emissions, which were approaching the BAAQMD 250 ppm/hr limit. SRU#3 converts acid gas consisting of SO2 and H2S to elemental sulfur in a catalytic reactor utilizing the "Claus" process. The SRU#3 vent gas is routed through a Shell Claus Offgas Treatment (SCOT) plant for additional treatment. The SCOT-3 vent gas is routed through a catalytic oxidizer to convert remaining H2S to SO2. By 11am all acid gas feed had been removed from SRU#3. Approximately an hour later, at 12:15 p.m. the catalytic oxidizer experienced a temperature excursion (most likely resulting from burning sulfur), which led to a plume from the SCOT-3 stack by 12:30 p.m. At 12:30 p.m., Shell called the incident a Level 1. At 12:35am, the Shell IC upgraded the incident to a CWS Level 3 and sounded sirens. Steam and nitrogen were used to cool the catalytic oxidizer. CCHS field observations identified black	dissipated quickly. Event was over very quickly.

	identified black plume, which dissipated very quickly and no plume was visible after about 10 or 15 minutes. Shell secured the unit at 12:57 p.m. CCHS called the official "All Clear" at 1:21 p.m.		
Loctite Bay Point Pittsburg, CA February 21, 2002	Considerable smoke was released from a 55-gallon drum containing intermediate adhesive product (epoxy resin). The smoke was caused by an exothermic runaway reaction (Monkey) that occurred due to addition of excessive hardener to the drum.	Drum moved from manufacturing area to outside.	Smoke released. Level 3 was called with sirens activated. People living downwind were asked to shelter-in-place.
Chevron Richmond, CA January 31, 2002	Release of sulfur dioxide from the #3 SRU plant. A high vapor/liquid flow condition was created by the Isomax #4 H2S plant when a normal heat exchanger backwash was being performed, which caused an interlock plant shutdown at #3 SRU. The momentary release occurred while restarting the plant.(Level 3 initiated by CCHS.)	Shutdown Isomax and the #3 SRU.	A few calls were reported to the facility expressing concern or inquiring as to the activity taking place. People in Richmond were asked to shelter-in-place.
Ultramar (now Tesoro)	Release of sulfur dioxide from	Shutdown their sulfuric acid	No measurable emissions of sulfur

(now Tesoro) Martinez, CA January 26, 2002	trioxide from the acid plant was released. A malfunction of the sonic meter system to measure concentration of 99% H_2SO_4. The acid became super saturated with sulfur trioxide, and the sulfur trioxide was released out of the stack.	acid operations.	quantities of sulfur trioxide or sulfur dioxide were measured offsite. Sirens and CAN was activated. People in Clyde and North Concord were asked to shelter-in-place.
General Chemical Richmond, CA November 29, 2001	The 99.5% sulfuric acid concentration was super saturated, which caused a release of sulfur trioxide.	The plant was starting up. Shut down the plant.	Sulfur trioxide and sulfur dioxide went offsite and a Level 3 was called. Sirens were activated. People from the communities downwind were asked to shelter-in-place.
Equilon (Now Shell) Martinez, CA October 17, 2001	Cat cracker release of soot, catalyst, and hydrocarbons during another catalytic cracking unit upset (same unit as 10/14, 2001 incident). More than 50,000 lbs hydrocarbons emitted.	Cat cracker unit shutdown to do a full investigation. Unit was down for 2 months.	Mostly hydrocarbons were released. A Level 3 was called with sirens and CAN being activated. The people in the community downwind were asked to shelter-in-place. Interstate 680 was shutdown for most of the duration of the release. Numerous calls from community.
Equilon (Now Shell) Martinez, CA October 14, 2001	Cat cracker release of soot, catalyst, and hydrocarbons during catalytic cracking unit upset. More than 5,000 lbs hydrocarbons emitted.	Cat cracker was starting up and had to discontinue the startup.	Soot dusted the Martinez area that is north of the refinery. Odors were smelled over a mile north of the refinery. Level 3 was called with sirens being sounded. CAN was not used, since the incident was over before CAN could be used.
Equilon (Now Shell) Martinez, CA	An upset occurred in the straight run hydrotreater unit	Unit upset resulting in unit shutdown. One	Smoke and hydrocarbons released. Level 3 was called with

Martinez, CA July 18, 2001	hydrotreater unit in the light oil processing area. Subsequently, fires occurred in the vacuum flasher heater furnace and crude unit heater furnace. Hydrocarbons, H2S, and smoke released offsite. Level 3 under CWS, sirens activated.	shutdown. One MRC emergency responder slightly injured when a fire truck fitting struck his leg.	Level 3 was called with sirens activated.
General Chemical Richmond, CA May 1, 2001	Truck hit a power line and GCC lost power. A release of sulfur dioxide occurred when the decomposition chamber went positive.	The plant shutdown and had problems when starting up. Another release occurred.	Sulfur dioxide went offsite and a Level 3 was called. Sirens and CAN were activated. People were asked to shelter-in-place downwind of the plant.
MBA Polymers Richmond, CA October 26, 2000	MBA Polymer recycles plastics from computer components. They cut the plastics and fines are collected in a vent system. The dust from the cutting operation is believed to have found an ignition point and a dust explosion and a fire occurred.	One worker was killed and four others injured. The initial concern was a fire, since there is very little hazardous materials handled at the site. The concern was that the by-products of the fire was toxic and when the wind shifted and was going in the direction of a residential area sirens were sounded and telephone calls were made. One employee was killed and there was major impact to the building.	Because smoke was impacting the community. Sirens and telephone calls were made after the wind shifted and there was a concern that the smoke was going into the neighborhood.

Tosco (now Tesoro) Avon, CA June 6, 2000	A fire at the coker unit. Naphtha was released from the flushing oil tank and caught on fire.	The #5 Boiler was shutdown. Two contractors had minor injuries.	Smoke from the fire was visible offsite. With the #5 boiler offline, particulates were released into the air from the stack.
Tosco (now Tesoro) Avon, CA March 22, 2000	A fire occurred at the alkylation unit. A contractor was welding in the alkylation unit with a fire watch spraying down any errant sparks. The firewater caught on fire because flammable hydrocarbons backed into the fire waterline.	Two contractors were injured.	None.
Tosco (now ConocoPhillips) Rodeo, CA February 7, 2000	Catacarb leak and hydrogen fire at the unicracking unit. The fire lasted approximately 10 minutes. Localized corrosion caused a pipe to fail and dumped the Catacarb from the unit and then hydrogen was released and ignited.	Unit shutdown loss of the supply of Catacarb.	Smoke visible offsite.
Tosco (now ConocoPhillips) Rodeo, CA January 15, 2000	Flaring from the MP-30 ground flare for approximately 2 hours. The low level point in the header caused the flaring.	Unit shutdown.	Black smoke visible offsite.
Tosco (now ConocoPhillips) Rodeo, CA December 16, 1999	Overpressure of the flare header system where the MP-30 ground flare was used. There was a low point in the flare header that	Unit shutdown.	Black smoke that could be seen as far away as Emeryville. People in Rodeo were asked to shelter-in-place.

	accumulated liquids.		
Chevron Richmond, CA March 25, 1999	Isomax fire that required the sounding of sirens. A valve stem blew out that caused a release of hydrocarbons and hydrogen sulfide that ignited, resulting in a major fire.	Shutdown a major part of the refinery - two people slightly injured fighting the fire.	Smoke was visible over much of the North Bay Area - Disruption in traffic - Sirens sounded, people were asked to shelter-in-place.
Tosco (now (now Tesoro) Avon, CA February 23, 1999	50 crude unit flash fire killing 4 people and seriously injuring another.	The shutdown of 50 crude and then later the shutdown of the whole refinery. Four people died with another seriously injured.	None.
Tosco (now ConocoPhillips) Rodeo, CA April 23, 1997	An upset in the distillation unit sent hydrocarbons to the sulfur recovery units. The sulfur recovery units released hydrogen sulfide.	Shutdown parts of the refinery until the problem was found and the different units were stabilized.	People were asked to shelter-in-place in Tormey and Crockett.
Tosco (now Tesoro) Martinez, CA January 27, 1997	A hydrocracker had a run away reaction that raised the temperature and pressure of the outlet gases. An outlet pipe failed and caused an explosion and fire. One worker was killed and forty-six people sought medical attention.	One worker was killed and forty-six other sought medical attention. Many of the people seeking medical attention were injured while running away from the explosion and fire. The outlet piping and some of the equipment and instrumentation was damaged. The	There was little of no offsite impact from this explosion and fire. People were not asked to take any protective action, such as sheltering place.

		The hydrocracker unit was shutdown until the unit could be repaired.	
Unocal (now ConocoPhillips) Rodeo, CA May, 1996	A hot coke drum was dumped and a fire was initiated.	Fire damage to the coker unit. The coker unit was run at partial capacity until repairs could be made.	People were asked to shelter-in-place in Tormey and Crockett. A few people in Vallejo sought health care assistance complaining of the smoke and odors.
Shell Martinez, CA April 1, 1996	Fire at their cracked gas unit. The fire lasted for over 3 hours.	Fire damage was extensive onsite. The unit was shutdown until repairs could be made.	People were asked to shelter-in-place downwind of the refinery. The smoke from the fire impacted the area downwind.
Air Products Martinez, CA February 1, 1996	Piping failed because of corrosion and a release of hydrogen occurred with an explosion. The fire lasted approximately 10 minutes.	Shutdown of the hydrogen unit.	Noise of the explosion was heard offsite for well over a mile. Some minor damage offsite.
Unocal (now ConocoPhillips) Rodeo, CA June 16, 1995	Tank fire that continued to burn off and on for approximately 1 week.	Response from the facility along with the local fire departments.	Smoke impacted the communities of Crockett, Rodeo, CA and Tormey. The communities were asked to shelter-in-place. Odors lingered in the communities for a week after the fire. Unocal put up approximately 100 people in motels until the incident was 100% secure.
Unocal (now ConocoPhillips) Rodeo, CA	A column used to strip carbon dioxide developed a leak. The column continued to	The Catacarb® affected the health of many of the workers downwind of	The release impacted the communities of Crockett, Rodeo, CA and Tormey. Many homes and cars were

August 22 - September 6, 1994	continued to operate for a 16-day period. The hole in the column became larger where a solution of Catacarb® was atomized and released. Estimates of between 80-225 tons of Catacarb® was released.	downwind of the column. At the end, the hydrocracker processing unit was shutdown.	homes and cars were cleaned to remove the Catacarb® solution. A health clinic setup by Unocal in Crockett treated over 1200 people over the next year. Some people are still complaining of health effects from the release.
General Chemical Richmond, CA July 26, 1993	Overheating of a tank car of 35% oleum that released between 4 and 8 tons of sulfur trioxide over a three hour and forty-five minute period. The sulfur trioxide formed a sulfuric acid cloud.	The loss of a tank car of 35% oleum and the shutting down of their processing.	Over 22,000 people sought medical assistance with 15-22 people staying in the hospital overnight. People were asked to shelter-in-place downwind of the release.
Rhône Poulenc (now Rhodia) Martinez, CA May, 1992	Sulfuric acid mixed with hydrocarbon spill and fire. The fire was difficult to put out because the sulfuric acid would break down the foam used by the fire fighters. One employee was killed and another was seriously injured.	Fire damaged some of the equipment onsite. The man who died and the one who was injured were Rhône Poulenc employees.	Smoke did go offsite and impacted the community. The smoke also included the degradation products of the sulfuric acid (e.g., sulfur trioxide, sulfur dioxide). Shelter-in-place was called for the community downwind of the fire.

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Production and processing of sour crude and natural gas - challenges due to increasing stringent regulations

Darkhan Duissenov

Petroleum Engineering
Submission date: June 2013
Supervisor: Jon Steinar Gudmundsson, IPT

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Abstract

The worldwide demand for petroleum is growing tremendously. It is expected that the demand will have incremental capacity of 20 mb/d for crude oil, reaching 107.3 mb/d, and demand for natural gas will rise nearly 50% to 190 tcf in 2035, compared to 130 tcf now. According to the International Energy Agency 70% of crude oil reserves and 40% of natural gas reserves are defined as having high content of organosulfur compounds. Obviously, for decades to come, to satisfy the growing global needs for fossil fuels, reservoirs with sour contaminants will be developed intensively.

The sulfur compounds in crude oils and natural gas generally exist in the form of free sulfur, hydrogen sulfide, thiols, sulfides, disulfides, and thiophenes. These compounds can cause considerable technical, environmental, economic, and safety challenges in all segments of petroleum industry, from upstream, through midstream to downstream.

Currently, the sulfur level in on-road and off-road gasoline and diesel is limited to 10 and 15 ppm respectively by weight in developed countries of EU and USA, but this trend is now increasingly being adopted in the developing world too. Furthermore, it has to be expected that the sulfur level requirements will become more and more strict in the foreseeable future, approaching zero sulfur emissions from burned fuels.

The production of ultra low sulfur automotive fuels has gained enormous interest in the scientific community worldwide. Oxidative desulphurization, biocatalytic desulphurization, and combined technologies, which are alternatives to conventional hydrodesulphurization technology, are much more efficient and more economical in removing complex sulfur compounds, especially benzothiophene, dibenzothiophene and their alkyl derivatives.

Keywords: *product quality specifications, H_2S corrosion, hydrodesulphurization, biocatalytic desulphurization, oxidative desulphurization*

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1. Introduction

Fossil fuel-based hydrocarbons are a primary energy source for current civilizations, which nowadays accounts for 83% of global energy consumption, and this tendency is forecasted to continue even after two decades (Pratap, 2013). However, to satisfy such rapidly growing appetite for fossil fuels, the petroleum industry will have to face a lot of challenges. Oil and gas companies, which have always preferably produced the oil and gas from the reservoirs technically the easiest to develop, will have to develop more complex and extremely challenging sour hydrocarbon projects. In the nearest future, crude oil and natural gas with high sulfur content will be the energy source of choice to meet increasing demand.

In order to understand the importance of those challenges thorough analysis of hydrocarbon quality is needed. To start with, it should be that the value of the reservoir fluid is commonly based on its quality characteristics. Lower quality Dubai crude is sold at discount rate to lighter, sweeter Brent crude. Sulfur content is among the most important characteristics of the crude oil and natural gas. Currently, there is a negative trend of increase of sulfur content in hydrocarbons worldwide. If US sulfur content of crude oil input to refineries was 0.88% in 1985, as of February 2013 it was 1.44% (EIA, 2013).

Another unfavorable for refineries tendency regards to environmental sulfur regulations. If in 2012 the maximum allowable level of sulfur was 795 ppm in Africa, 605 ppm in the Middle East, 520 ppm in Latin America, in 2030 it is expected to decrease the sulfur content to 95 ppm, 16 ppm, and 30 ppm respectively. The other nations of the world are moving towards environmentally friendly transportation fuels too. New transportation fuel specifications are being put into effect worldwide. As a result, those contradirectional factors, such as hydrocarbon quality deterioration and reducing the maximum allowable level of sulfur, are making the situation even worse.

However, before considerable investment will be put in completely new technologies and tools, the industry has to deal with existing problems. There are number of technical, economical, and environmental problems. All of them are caused by the presence of organosulfur compounds in petroleum. They are very undesirable, because of their actual

or potential corrosive nature, disagreeable odor, deleterious effect on color or color stability, and unfavorable influence on antiknock and oxidation characteristics. Furthermore, sulfur compounds poison expensive refining catalysts and pollutes into the atmosphere in a form of sulfur oxides when burned, causing environmental problems. Emissions of sulfur compounds formed during the combustion of petroleum products are the subject of environmental monitoring in all developed countries.

Crude corrosivity problems have been studied since 1950's mostly because of their severity and economic impact on production and refining operations. To date the annual cost of corrosion worldwide is estimated at over 3% of GDP of the planet, which is literally 3.3$ trillion. Without taking into account the progress made in understanding the role of different parameters on the corrosion process, modern scientific society cannot give exact answers in understanding and prediction of petroleum corrosivity.

Hydrocarbon producing companies in order to meet the stringent environmental and safety requirements are in search of "green" and cost-effective methods for desulphurization of crude oil and natural gas. Desulphurization is costly technology and petroleum refiners could spend 25 billion USD over the next decade (Monticello, 1996). Commonly used conventional desulphurization technology - hydrodesulphurization - is expensive and does not efficiently handle sulfur removal in a number of situations. Hence, other efficient desulphurization technologies, as biocatalytic desulphurization, oxidative desulphurization are being used in test scale and commercial scale projects.

The main purpose of this master thesis is to analyze the rising sulfur problem and outline the needs for better technologies to remove the sulfur. The analysis has been done based on annual energy reviews, from different sources, such as OPEC, BP, EIA, and others. The origin and the types of sulfur present in hydrocarbons are studied. Also commercial, semi-commercial, and test scale desulfurization technologies are reviewed.

2. World petroleum reserves

British Petroleum defines the term proved reserves of crude petroleum as those quantities of petroleum that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions (BP, 2012).

As of January 2013, the estimated world proved reserves of crude petroleum were 1.6 billion barrels. OPEC currently accounts for 73.6% of total world oil reserves. Venezuela with its heavy, sour crude holds the largest share of the world's petroleum reserves at 18% of the total, as a result of recent reserves identified in this country. Other countries with the biggest crude oil reserves are Saudi Arabia (16.2%), Canada (10.6%), Iran (9.4%) and Iraq (9.6%) (Table 20).

On a regional basis, the Middle East accounts for nearly 48% of the world's reserves. Central and South America is second with 20%, following recent reserves identified in Brazil and Venezuela, and North America is third with 13% (Figure 1).

The International Energy Agency (IEA) estimates that 70% of the world's remaining oil reserves consist of heavy, high sulfur crude. Moreover, there is a common tendency in all big discoveries found in the last 30 years. The crude from these new oil fields tends to be heavy, difficult to extract, with high sulfur content. One of the reasons of crude oil quality deterioration is depletion of production from conventional, commonly sweet reservoirs. This trend can be seen by looking at the history of crude oil production, which is now extending over more than 150 years (Zittel & Schindler, 2007):

- Virtually all the world's largest oil fields were all discovered more than 50 years ago;
- Since the 1960s, annual oil discoveries tend to decrease;
- Since 1980, annual consumption has exceeded annual new discoveries;
- Till this day more than 47,500 oil fields have been found, but the 400 largest oilfields (1%) contain more than 75% of all oil ever discovered;

When it comes to natural gas proved reserves the Middle East and Europe & Eurasia region account for 75% of whole world's reserves (Figure 2). In fact, 40% of the world's natural or associated gas reserves currently identified as remaining to be produced,

representing over 2600 trillion cubic feet (tcf), are sour, with both H_2S and CO_2 present most of the time. Among these sour reserves, more than 350 tcf contain H_2S in excess of 10%, and almost 700 tcf contain over 10% CO_2 (Lallemand et al., 2012).

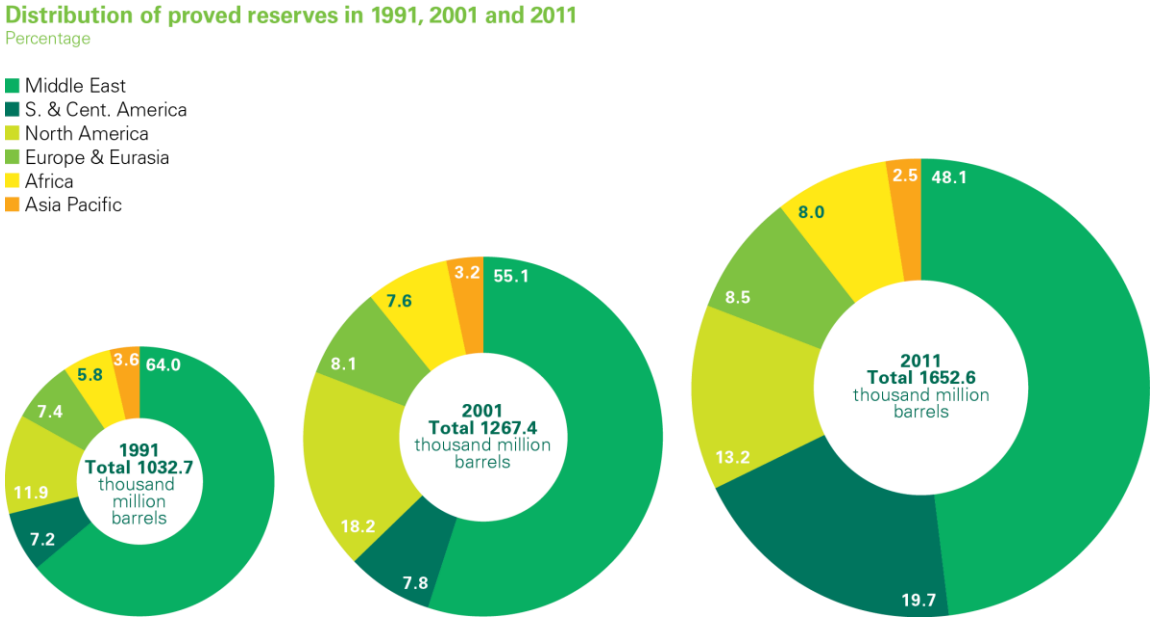


Figure 1 *Distribution of proved reserves of crude oil in 1991, 2001 and 2011 (BP, 2012)*

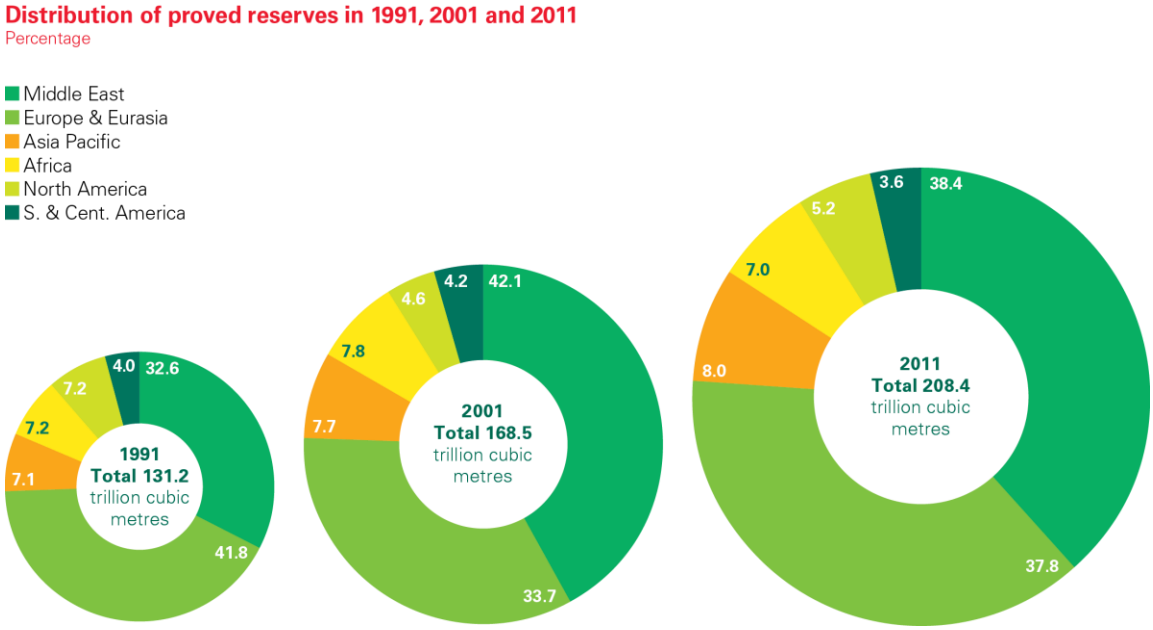


Figure 2 *Distribution of proved reserves of natural gas in 1991, 2001 and 2011 (BP, 2012)*

3. Petroleum supply and demand outlook

Worldwide crude oil production is forecasted to increase to meet the growing consumption, at the same time the sources of growth will change the global balance. Global crude oil supply is set to rise by about 16.5 Mb/d by 2030. 75% of the global supply growth will be accounted to OPEC. Crude supply decline from Europe, Asia Pacific, and North America is expected to offset by growth in deepwater Brazil and the FSU (BP, 2011).

Non-OPEC output will rise by nearly 4 Mb/d. Unconventional supply growth should more than offset declining conventional output, with biofuels adding nearly 5 Mb/d and oil sands rising by nearly 2 Mb/d (BP, 2011).

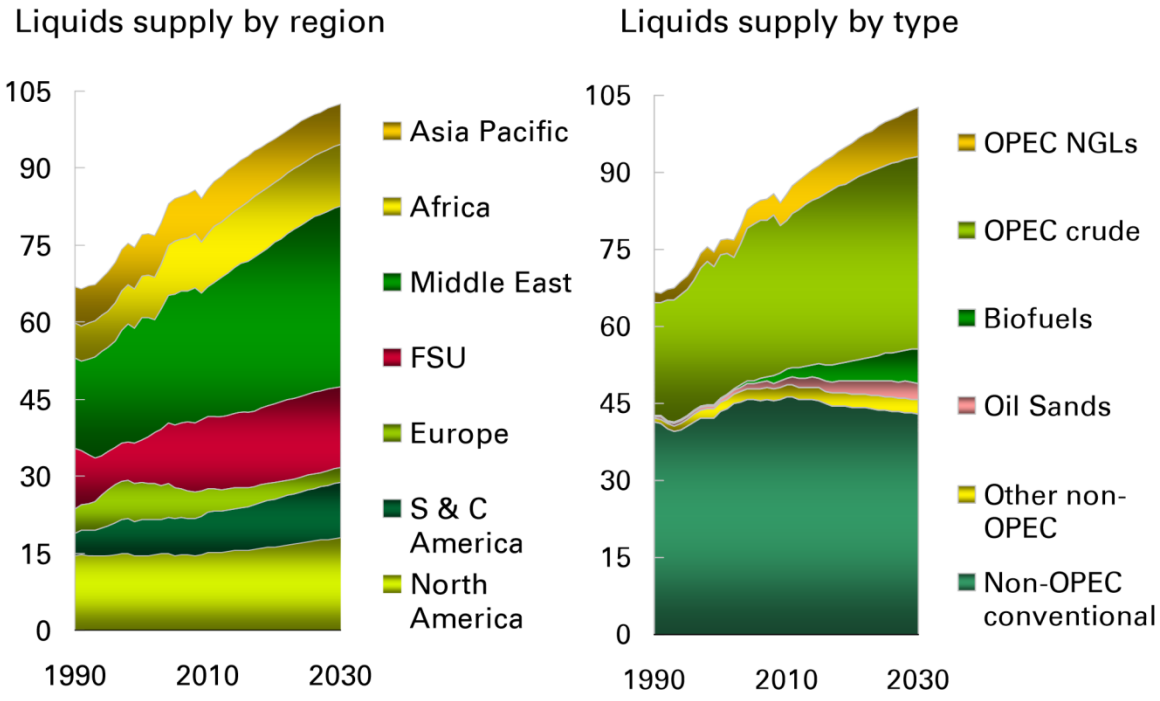


Figure 3 *Worldwide petroleum liquids supply outlook (BP, 2011)*

The global crude oils demand is also predicted to increase, but growth slows to 0.8% p.a. (from 1.4% p.a. in 1990-2010 and 1.9% p.a. in 1970-90). The OPEC is forecasted the demand for crude oil for long-term period from 2010 to 2035. The outlook for oil demand is shown in Table 1. In the forecasting period of 25 years demand will have an incremental capacity of 20 mb/d, reaching 107.3 mb/d by 2035. 87% of the increase in crude oil demand in developing Asia, whereas OECD demand shows a steady decline, as

it was already peaked in 2005 (OPEC, 2012). Non-OECD consumption is likely to overtake the OECD by 2014, and reach 66 Mb/d by 2030.

Table 1 *World oil demand outlook (mb/d) (OPEC, 2012)*

	2010	2015	2020	2025	2030	2035
OECD America	24.1	23.7	23.5	23.0	22.4	21.7
OECD Europe	14.7	13.7	13.4	13.0	12.6	12.1
OECD Asia Oceania	8.1	8.4	8.2	8.0	7.6	7.3
OECD	**46.8**	**45.8**	**45.2**	**44.0**	**42.6**	**41.1**
Latin America	4.9	5.4	5.8	6.1	6.4	6.6
Middle East & Africa	3.3	3.8	4.1	4.5	4.8	5.1
India	3.3	4.0	4.9	6.0	7.4	9.0
China	9.0	11.1	13.2	15.0	16.4	17.6
Other Asia	6.8	7.5	8.4	9.1	9.7	10.3
OPEC	8.1	9.0	9.8	10.6	11.4	12.0
Developing countries	**35.4**	**40.8**	**46.3**	**51.3**	**56.0**	**60.6**
Russia	3.2	3.5	3.6	3.6	3.6	3.6
Other Eurasia	1.6	1.7	1.8	1.9	2.0	2.1
Eurasia	**4.8**	**5.2**	**5.4**	**5.5**	**5.6**	**5.6**
World	**87.0**	**91.8**	**96.9**	**100.9**	**104.2**	**107.3**

The transportation sector is a key to future oil demand growth. OECD consumption will fall to 40.5 Mb/d. Figure 4 shows the increasing tendency in oil consumption in road transportation. It can be easily seen that by 2020, non-OECD oil use in road transportation (nearly 14 Mb/d) will be greater than in the OECD. Furthermore, the majority of this increase will be dominated by developing Asian countries, especially China and India.

Demand for natural gas will rise nearly 50% to 190 tcf in 2035, compared to 130 tcf for now. Gas demand in the forecasting period will be mainly driven by non-OECD countries, with growth averaging 3% p.a. to 2030 (Figure 5). On the top of the demand growth is non-OECD Asia (4.6% p.a.) and the Middle East (3.9% p.a.). Of the major sectors globally, growth is fastest in power (2.6% p.a.) and industry (2% p.a.) which matches with historic patterns., Compressed natural gas use in transport is confined to 2% of global transport fuel demand in 2030, with threefold increase from today's level (BP, 2011).

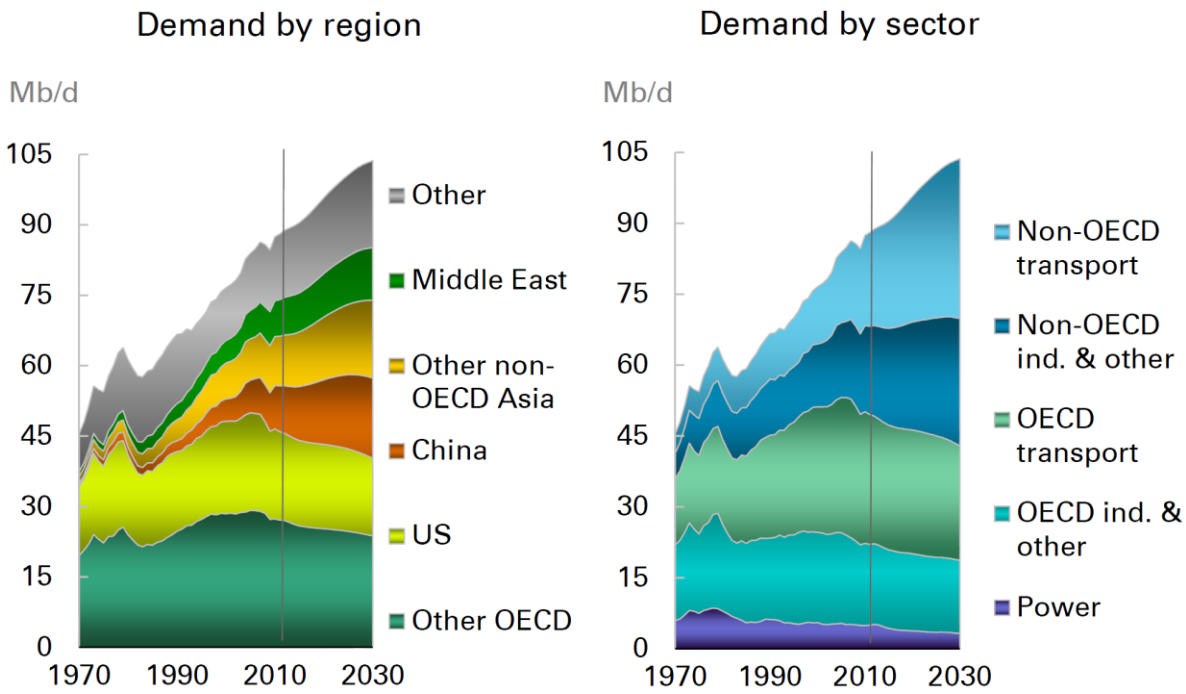


Figure 4 *Worldwide petroleum liquids demand outlook 1970-2030 (BP, 2013)*

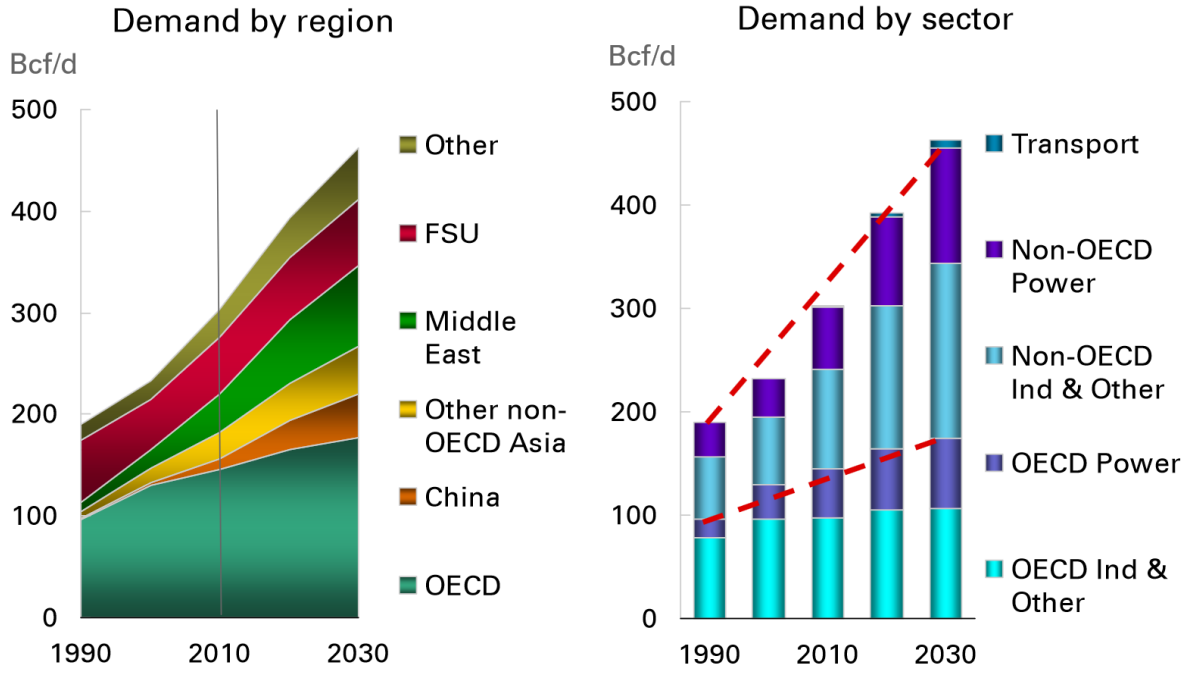


Figure 5 *Worldwide gas demand outlook 1990-2030 (BP, 2011)*

4. Crude quality outlook

4.1 Density and API gravity of crude oil

Crude oil quality is measured in terms of density and divided into four groups such as light, medium, heavy and extra heavy crudes (Figure 6). Those groups are defined depending on the value of degrees API. Density in degrees API is a unit of measurement of oil density, developed by the American Petroleum Institute. Measurement of degrees API allows us to determine the relative density of oil to the density of water at the same temperature of 15.6 degrees Celsius. The API degree is found with the following formula:

$$API = \frac{141.5}{SG} - 131.5$$

The SG stands for specific gravity or relative density, which is equal to the density of the substance divided by the density of water (density of water is 1000 kg/m^3). So if the API gravity is greater than 10, then the oil is lighter and floats on water, and if less than 10, then drowned (Wikipedia, 2012). API gravity was designed so that most values would fall between 10° and 70° API gravity (Schlumberger, 2012).

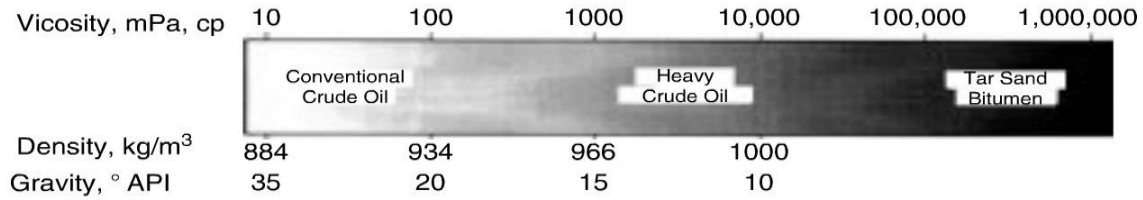


Figure 6 *Classification of petroleum, heavy oil, and bitumen by API gravity and viscosity (Speight, 2007)*

Depending on API gravity crude oils are classified as follows (Figure 6):

- Light: API>31.1
- Medium: 22.3<API<31.1
- Heavy: API<22.3
- Extra heavy: API<10.0

4.2 Sweet and sour crude oil

Depending on the amount of sulfur the crude oil can be sweet or sour. When the total sulfur level in the oil is less than 0.5 % the oil is called sweet and if it is more than that the oil is called sour. Sweet crude oil is more preferred by refineries as it contains valuable chemicals which is needed to produce the light distillates and high quality feed stocks.

Historically, early prospectors tasted the crude oil to determine its quality. Crude petroleum had a sweet taste and pleasant smell if the content of sulfur was low. For this reason, sweet crude is a low sulfur crude oil (FSU, 2010).

Sweet crude is easier to refine and safer to extract and transport than sour crude. Because sulfur is corrosive, light crude also causes less damage to refineries and thus results in lower maintenance costs over time.

Major locations where sweet crude is found include the Appalachian Basin in Eastern North America, Western Texas, the Bakken Formation of North Dakota and Saskatchewan, the North Sea of Europe, North Africa, Australia, and the Far East including Indonesia.

Table 2 *Quality levels - API gravity and sulfur content (Eni, 2012)*

Crude Oil Class	Property Range	
	Gravity (°API)	Sulfur (wt. %)
Ultra Light	>50	<0.1
Light & Sweet	35-50	<0.5
Light & Medium Sour	35-50	0.5-1
Light & Sour	35-50	>1
Medium & Sweet	26-35	<0.5
Medium & Medium Sour	26-35	0.5-1
Medium & Sour	26-35	>1
Heavy & Sweet	10-26	<0.5
Heavy & Medium Sour	10-26	0.5-1
Heavy & Sour	10-26	>1

As opposed to sweet crude sour crude is sold at a discount to lighter sweeter grades. Because the sulfur compounds in the crude oils are generally harmful impurities, they are toxic, have an unpleasant odor, contribute to the deposition of resin and in combination with water causes intense corrosion (K-Oil, 2012). Even though it does not restrains the production of inconvenient crude and the data shows that from 1995 to 2011 medium-sour and sour crude has been the major hydrocarbon produced in the world taking about 55 to 60% of whole crude production, which is shown in Table 22.

Major regions with vast sour crude reserves: North America (Alberta (Canada), United States' portion of the Gulf of Mexico, and Mexico), South America (Venezuela, Colombia, and Ecuador), Middle East (Saudi Arabia, Iraq, Kuwait, Iran, Syria, and Egypt).

4.3 Benchmarks of crude oil

The knowledge of commercial value of the reservoir fluid is of vital importance, as petroleum companies is aimed on getting as much profit as possible. The profit is a function of the cost of petroleum. The cost is based on quality characteristics, such as density and sulfur content which are the most important characteristics of the crude. Depending on the chemical composition and the presence of various chemical elements the term benchmark or market crude should be introduced.

The general concept of benchmarking is to classify crude oil based on its quality. The introduction of grading has become necessary due to the different composition of oil as sulfur content, alkane content and the presence of impurities, in addition to where it is located. For the convenience of trade market and to keep the balance between supply and demand typical benchmarks were created. Prices for other crudes are determined by the differentials to benchmarks (K-Oil, 2012). The major crude oil benchmarks are grouped as follows:

(i) West Texas Intermediate (WTI)

West Texas Intermediate is reference crude, which is produced in Texas. The density is about 40° API and sulfur content ranges from 0.4 to 0.5 %. It is mostly used to produce gasoline and therefore that type of oil is in high demand, especially in the United States and China (UP Trading, 2012).

(ii) Brent Blend

Brent is a reference grade of oil from the North Sea. The oil price of Brent is in the basis for the pricing of about 40% of world oil prices from 1971. The word Brent stands for Broom, Rannoch, Etieve, Ness and Tarbat.

(iii) Dubai

Dubai Crude has a gravity of 31° API and a sulfur content of 2 %. It is extracted from Dubai. Dubai Crude is used as a price benchmark because it is one of only a few Persian Gulf crude oils available immediately.

(iv) Tapis Crude

Tapis is the benchmark for light sweet Malaysian crude. The sulfur content is as low as 0.03% and the API gravity is around 45.5. Although this oil marker is not as widely traded as WTI, it is used as a benchmark in Asia (EconomyWatch, 2010).

(v) Bonny Light

Bonny Light is a benchmark for high grade Nigerian crude, with an API of around 36. Due to its very low sulfur content, it corrodes the refinery infrastructure minimally (EconomyWatch, 2010).

(vi) OPEC Basket

OPEC Basket is the pricing data formed by collecting seven crude oils from the OPEC nations (except Mexico). These include Saudi Arabia's Arab Light, Algeria's Saharan Blend, Indonesia's Minas, Nigeria's Bonny Light, Venezuela's Tia Juana Light, Dubai's Fateh and Mexico's Isthmus. This information is used by OPEC to monitor the global conditions of the oil market (EconomyWatch, 2010).

The crude oils represented in Figure 48 are selection of some of the crude oils marketed in various parts of the world. There are some crude oils both below and above the API gravity range shown in the chart (EIA, 2012). Moreover, quality levels as API gravity and sulfur content are presented on Table 23. The classification ranges from ultra-light to heavy and sour and gives the data on daily production.

4.4 Future trends on crude quality characteristics

Crude oil quality, typically measured in terms of API gravity and sulfur content, does, and will increasingly play a major role in determining future refining requirements. Historically, the average quality of crude oil has been declining steadily. Average sulfur content has been increasing considerably and more rapidly than API gravity. And this trend likely to continue for the foreseeable future (MathProInc., 2011).

The detailed analysis on the expected quality changes in oil supply streams with the projection to 2035 are presented in Figures 7 and 8. The figure is projected to improve marginally to around 33.5° API by 2015, from 33.4° API in 2010, and then move back to 33° API by 2035, a level not very dissimilar to the present one. Figure 8 also underscores that the global average for the entire forecast period is anticipated to remain in a fairly narrow range of less than 1° API. Average sulfur content projections are also can be observed (Figure 7). The expected variations in average sulfur content are wider; they are in the range of 10-15% over the 25-year forecast period (OPEC, 2011).

4.5 Product quality specifications

Refined products specification along with quality of crude oil which is used as a feedstock to the refineries another important aspect which significantly influences future downstream investments. In the last 30 years, downstream industry globally has put considerable amount of money in order to meet new petroleum product quality specifications. The very first regulations have affected the lead content in gasoline, and in the middle of 1990s the focus turned to sulfur content in automotive fuel, especially in the most industrialized countries.

The main purpose of those regulations is to yield high quality automotive fuels with sulfur content less than 10 parts per million (ppm). Moreover, regulators want to tighten sulfur content of other refined products, such as fuel oil, marine bunkers and jet fuel.

Some worldwide efforts have already been made to minimize the content of organosulfur compounds in finished products. This can be seen in Figure 49 and Figure 59, which show the global maximum permitted sulfur content in gasoline and on-road diesel fuel, respectively (as of September 2012).

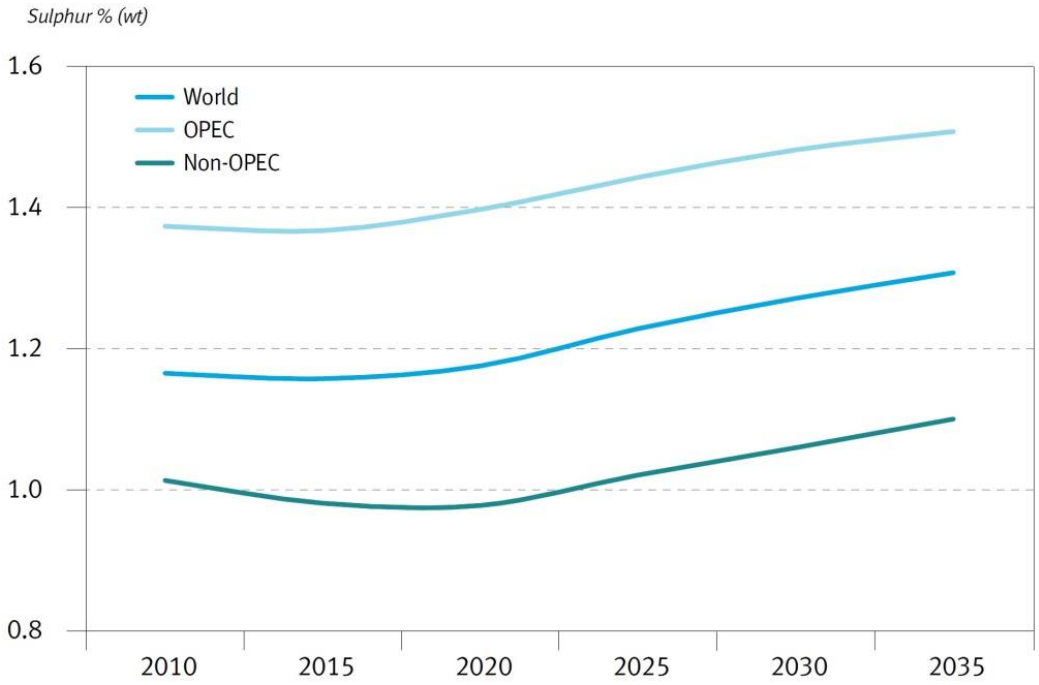


Figure 7 *Crude quality outlook in terms of sulfur content (OPEC, 2011)*

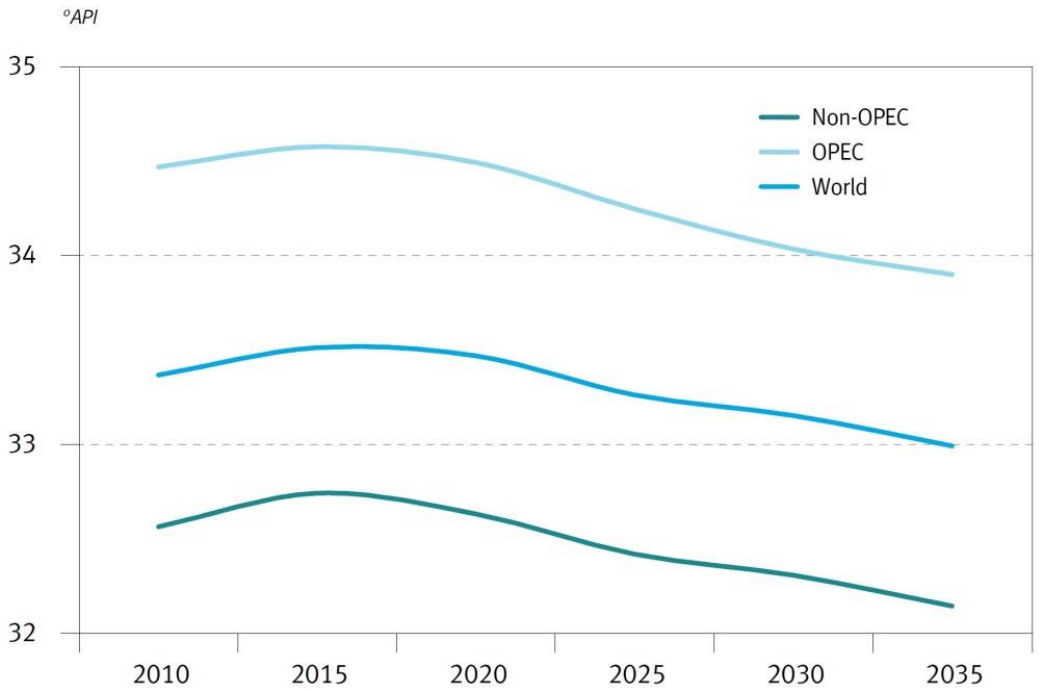


Figure 8 *Crude quality outlook in terms of API gravity (OPEC, 2011)*

However, it should be noted that actual sulfur content levels for products available in specific countries can differ from the ones permitted by regulators (OPEC, 2012).

(i) Gasoline quality specifications

Up-to-date petroleum product quality specifications lay stress upon the extensive use of gasoline with extremely low sulfur content. This tendency is especially noticeable in developed countries; nevertheless developing countries also expect nationwide penetration of low sulfur fuel.

This trend is particularly evident in developed countries, but it is now increasingly being adopted in the developing world too.

In the US the primary plan with its ultra-low sulfur gasoline program was to reduce sulfur to 80 ppm per gallon cap and 30 ppm annual average, as of 2004. Later, in 2010 US regulators have lowered the maximum standard to 30 ppm for all refineries, and California had set even lower specification at 15 ppm.

Since 2005, the EU refineries have produced certain quantities of 10 ppm gasoline together with 50 ppm fuels. As of January 2009, the situation has changed and the maximum allowable sulfur levels were further tightened to 10 ppm.

In China the sulfur limits are regulated on a regional basis. In the cities such as Shanghai, Guangzhou, Shenzhen, Dongguan and Nanjing the maximum sulfur level is set to 50 ppm, in Beijing it is set the strictest fuel quality requirement of 10 ppm, whereas the nationwide sulfur level is adjusted to 150 ppm in 2009. China is expected to lower its nationwide limits to 50 ppm by December 2013 and possibly to 10 ppm by 2016.

Similar tendency can be seen in India. Since 2010, 13 selected cities have lowered the sulfur content to 50 ppm, plus seven more cities since March 2012, whereas the nationwide sulfur gasoline level is 150 ppm. The Indian authorities made a list of 50 other cities with the big number of vehicles and high pollution, where it will be required to use the fuel with 50 ppm sulfur, and it is planned to be implemented by 2015.

Several other countries around the world are moving forward with lowering the maximum fuel sulfur content. This is particularly true in the Middle East, Russia, South Africa and some countries in Latin America. Saudi Arabia expects a nationwide penetration of 10

ppm gasoline by 2013, followed soon after by other countries in the Middle East region, while Russia plans to switch to 10 ppm gasoline by 2016. South Africa has agreed to enforce 10 ppm gasoline by 2017 (OPEC, 2011). Projected gasoline qualities in respect to sulfur content for 2012–2035 are shown in Table 3 (OPEC, 2011).

Table 3 *Expected regional gasoline sulfur content (OPEC, 2012)*

Region	2012	2015	2020	2025	2030	2035
US & Canada	30	30	10	10	10	10
Latin America	520	255	130	45	30	20
Europe	13	10	10	10	10	10
Middle East	605	235	75	25	16	10
FSU	315	115	35	20	12	10
Africa	795	493	245	165	95	65
Asia-Pacific	205	130	65	35	20	15

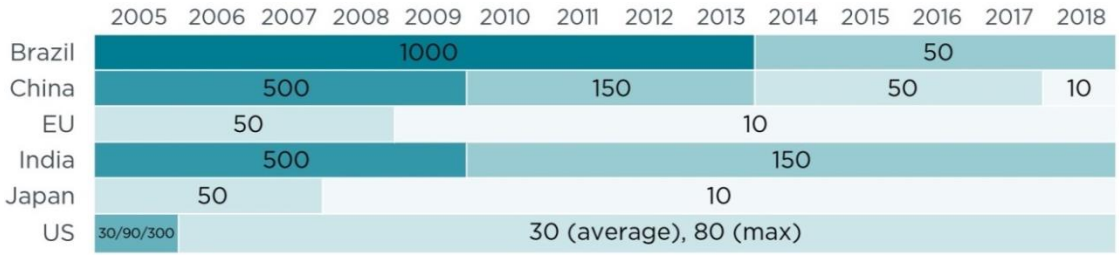


Figure 9 *Selected gasoline sulfur levels (ppm) in countries and regions around the world. Nationwide standards are shown; Brazil, China, and India have stricter fuel quality in some sub-national and municipal areas (ICCT, 2013)*

(ii) Diesel quality specifications

European Fuel Quality Directive has required the on-road and off-road diesel fuel sulfur content to be set at 10 ppm since 2011. Same maximum level of 10 ppm was legislated in Japan, Hong Kong, Australia, New Zealand, South Korea and Taiwan. A switch to 15 ppm for on- and off-road diesel was fully aligned in Canada since 2010. The same nationwide average level of 15 ppm came into effect in US in 2012, with the exceptions for small refineries, which are required to do so by 2014.

China planned to reduce its on-road diesel sulfur to 350 ppm in July 2012. This limit, however, is still not widely enforced. However, at the more regional level, Beijing has a diesel sulfur limit of 10 ppm, while cities of Shanghai, Guangzhou, Shenzhen, Dongguan

and Nanjing have required a 50 ppm maximum since May 2012. India has also set two different diesel fuel specifications, one for nationwide supply and the other for 20 selected cities. The sulfur content specification for 20 urban centers is established at a 50 ppm maximum, and the national specification is 350 ppm. Other countries in Asia where improvements in on-road diesel quality have been observed include Indonesia, Malaysia, Philippines and Thailand.

In Latin America, the maximum sulfur limit for premium diesel in Argentina was set to 10 ppm in June 2011. Chile has required 50 ppm diesel since 2006. In other countries, such as Brazil, Ecuador and Mexico the progress has been reported, however the majority of Latin America has sulfur limits for diesel oil above 500 ppm.

Totally different situation do exist in Africa. The average sulfur content is in the range of 2,000 to 3,000 ppm for on-road diesel, and much higher for off-road. The only exception is South Africa, which plans a switch to 10 ppm fuels by 2017.

Table 4 *Expected regional on-road diesel sulfur content (OPEC, 2012)*

Region	2012	2015	2020	2025	2030	2035
US & Canada	15	15	15	10	10	10
Latin America	1,085	440	185	40	35	20
Europe	13	10	10	10	10	10
Middle East	1,725	415	155	70	20	10
FSU	440	175	60	15	10	10
Africa	3,810	2,035	930	420	175	95
Asia-Pacific	400	200	100	45	25	15

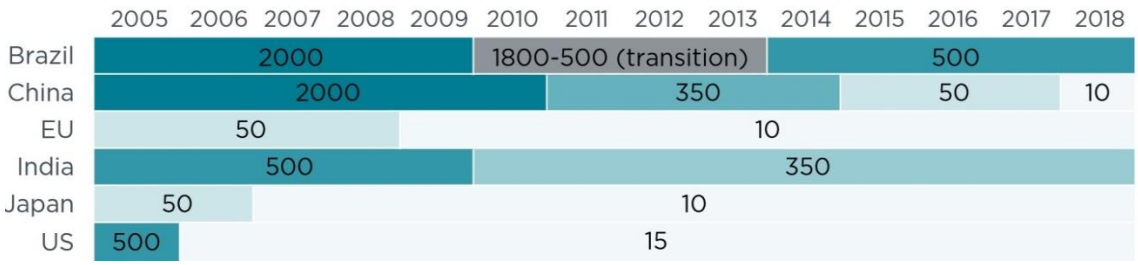


Figure 10 *Selected diesel fuel sulfur levels (ppm) in countries and regions around the world. Nationwide standards are shown; Brazil, China, and India have stricter fuel quality in some sub-national and municipal areas (ICCT, 2013)*

Table 4 summarizes regional diesel fuel qualities between 2012 and 2035 for on-road diesel, with a projected step-wise progress in quality improvements for all developing regions.

The authorities in Europe and North America already require ultra low sulfur level for on- and off-road fuel. The value is 15 ppm in North America and 10 ppm in Europe. By 2020, the most considerable reduction in sulfur content for on-road diesel compared to 2012 is projected to be in Latin America, the Middle East, and in FSU countries. With the exception of Africa, all regions are projected to reach an average on-road sulfur content of below 20 ppm by 2035 (OPEC, 2011).

(iii) Other products

In terms of other products, such as heating oil, jet kerosene and fuel oil, these are increasingly becoming targets for tighter requirements, especially in developed countries.

Sulfur content in Europe's distillate-based heating oil was reduced from 2,000 ppm to 1,000 ppm in January 2008, and some countries, for example, Germany, provide tax incentives for 50 ppm heating oil to enable the use of cleaner and more efficient fuel burners. Parts of North America plan to reduce sulfur levels in heating oil to 15 ppm before 2020. Elsewhere, some progress is expected to be made in reducing the levels of sulfur in heating oil, but not to very low levels, and only after the transition in transportation fuels is completed (OPEC, 2011).

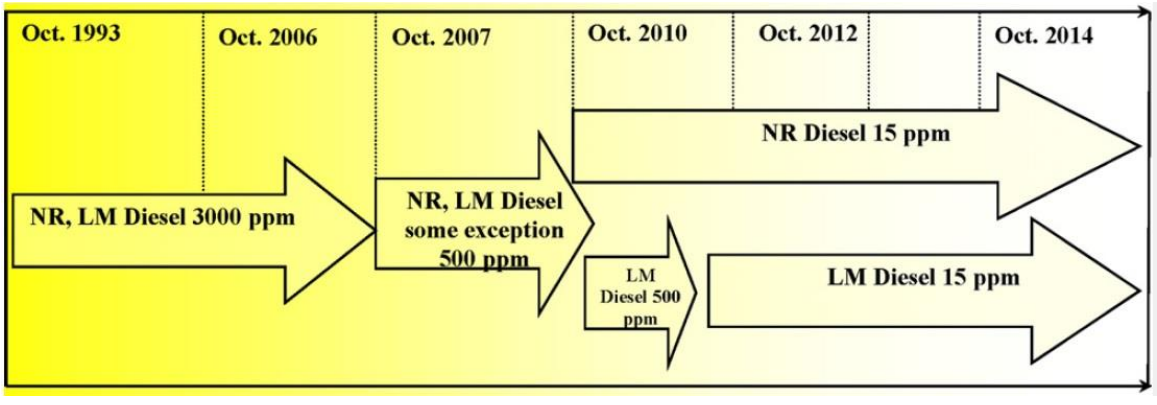


Figure 11 *Trends in sulfur specification for non-road diesel (NR, non-road and LM, locomotive and marine diesel) (Stanislaus et al., 2010)*

In Europe, reductions in the sulfur content of jet fuel have been discussed with initiatives aimed at global harmonization. However, no major progress has been achieved until now and, current jet fuel specifications still allow for sulfur content as high as 3,000 ppm, although market products run well below this limit, at approximately 1,000 ppm. Longer term, it is expected that jet fuel standards for sulfur content will be tightened to 350 ppm in industrialized regions by 2020, followed by other regions in 2025. Industrialized regions are also assumed to see a further reduction to 50 ppm by 2025 (OPEC, 2011).

Marine bunker fuels are also subject to regulation. As of January 2012, the global sulfur cap was lowered from 4.5% wt to 3.5% wt, and will be further lowered to 0.5% wt (5,000 ppm) as of January 2020. In September 2012, the European Parliament approved final legislation requiring all ships in the EU waters to switch to 0.5% wt sulfur fuel, or use corresponding technology allowing ships to reach the required emissions reduction, in 2020 (OPEC, 2011).

5. Challenges in production and processing

The studies on crude quality issues and up-to-date statistical data demonstrate all over again the relevance of the topic addressed. The quality of feedstock and crude slate is considerably deteriorating, becoming heavier and sourer (Figure 7-8). Commonly, the production and processing of high sulfur crudes and sour gases meet five major challenges, which have an effect on the development of energy efficient, low-cost technologies for separation units and to generally production schemes (Lepoutre, 2008).

Technical challenges

Crude oil and natural gas with high content of sulfur compounds claim complex and capital-intensive processes at all stages of production and handling, from upstream, through midstream to downstream segments of petroleum industry.

Technical challenges of development of high sulfur reservoirs are not defined directly. It differs from case to case. Nevertheless, there is a common challenge for almost all sour crude oil projects. This challenge is corrosion related problems. The corrosive environment is typically created when there is high content of H_2S and CO_2 combined with high pressure and high temperature. In such corrosive environment just a few materials can withstand. Moreover, because of high toxicity of the H_2S and the danger of metal failure as a result of stress corrosion cracking, extreme caution must be taken in selecting materials to drill and produce this type of energy source securely (Hamby, 1981). Causes of corrosion, corrosion control and mitigation tools will be described thoroughly in the following chapters.

Economic challenges

The next challenge is economic. It is linked to the high technical costs related to the production of sour crudes containing large amounts of acid gases. The size and the cost of process units and of acid gas handling facilities, such as H_2S transformation into sulfur units, shipping/storage of sulfur, compression, pumping or re-injection facilities, strongly dependent on the amount of feed stock.

Environmental challenges

The following challenge is environmental. Nowadays, the governments and environmental protection agencies have put limits on sulfur compounds in refined fuels. The tendency shows that one decade later the requirements will be much more stringent putting under the pressure oil and gas companies to develop more environmentally friendly technologies. To achieve this task significant amount of money has to be spent on research studies and process facilities.

Safety challenges

Production of sour oil and gas reserves with high content of hydrogen sulfide, leads to handle large quantities of this harmful gases. Hydrogen sulfide can be found in different states, the dense phase of it is precipitated in the acid gas facilities, and acid gas removal unit. Therefore, production and processing facilities is designed by taking account of sour gases, and it is particularly constrained by safety, because H_2S is highly toxic.

Sulfur marketing and environmental challenges

The last challenge is related to the sales of produced sulfur and its storage without harmful effect on the environment. Due to decreasing world demand for elemental sulfur, the economics of recovering sulfur from sour crude and natural gas has become unfavorable. The sulfur market is globally saturated. Even though, some companies are trying to find a solution for different utilization of sulfur, such as sulfur concrete, for instance.

5.1 Corrosion

Production, transportation and processing of crude oil and its following use as refined products and feedstock for chemicals claim a complex process. All of these processes are accompanied by various problems and corrosion is a major one, especially for the crude with high sulfur content. To date the annual cost of corrosion worldwide is estimated at over 3% of GDP of the planet, which is literally 3.3$ trillion. For that reason the problems related with corrosion is of extreme importance (Hays, 2013).

It is believed that corrosion should be controlled and mitigated at the early stage of indication. If not it can cause for the additional cost of lost time and involvement of

employee, repair of equipment or replacement of whole construction. Without considering corrosion the outcome can be fatal (Nenry & Scott, 1994).

A detailed discussion of corrosion problems has been given by Henry and Scott (1994). Depending on where the corrosion occurs they divided corrosion into several groups, such as Corrosion in the Chemical Industry, Corrosion in Petroleum Production Operations, Corrosion in Petroleum Refining and Petrochemical Operations, and Corrosion of Petrochemical Pipelines. The corrosion caused by sulfur compounds is the following.

5.1.1 Corrosion in petroleum production operations

There are several environmental factors that are more or less relative to oil and gas production operations. The most important one is the environment found in actual reservoir formations. Corrosives encountered in those formations are carbon dioxide, hydrogen sulfide, polysulfides, organic acids, and sulfur in elemental state.

The first corrosion related problem is the presence of sulfate-reducing bacteria (SRB). SRB is in charge of the majority of the bacterial problems in oil production. It sours crude oil and gas leading to corrosion problems, also making it more difficult to refine environmentally friendly, high quality fuels. SRB produces volatile and toxic hydrogen sulfide as a by-product of respiration (Figure 12). The maximum allowable level of H_2S is set as low as 3 ppm, because sulfide concentrations even below 1 mg/l in the water phase may lead to high corrosion rates (Dunsmore, Evans, Jones, Burton, & Lappin-Scott, 2006).

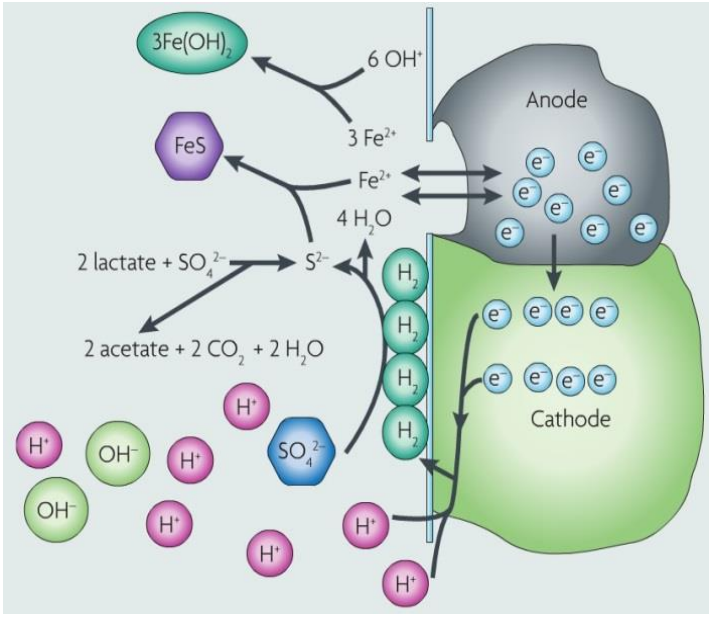


Figure 12 *Sulfate reducing bacteria and corrosion (Muyzer & Stams, 2008)*

Hydrogen sulfide is a relatively strong corrodent. When dissolved in water hydrogen sulfide is extremely corrosive as it becomes

a source of hydrogen ions. In the absence of buffering ions, under 1 atmospheric H_2S partial pressure and pH level of 4, water is equilibrated. However, under very high pressure conditions, pH values as low as 3 have been calculated (Nenry & Scott, 1994).

Another corrosive property of H_2S is that it acts as a catalyst to promote absorption by steel of atomic hydrogen formed by the cathodic reduction of hydrogen ions. As a consequence, sulfide-stress cracking (SSC) takes a place. SSC can occur when H_2S is in contact with high-strength steel generally used in drilling, completing, and producing wells. SSC is a type of spontaneous brittle failure which occurs at stresses well below the yield strength of the material. Three conditions must be present for SSC to be present. The first is a surface tensile stress which can be both applied and residual. The second requirement is that the material must be exposed. The third requirement is that embrittling agent, hydrogen sulfide, must be present in the reservoir (Emerson, 2012).

Hydrogen sulfide also enters into a reaction with elemental sulfur. In a gas phase, sulfanes (free acid forms of a polysulfide) under high H_2S partial pressure can be formed so that elemental sulfur becomes mobile and is produced along with gaseous mixtures. Nevertheless, elemental sulfur starts to precipitate as a result of pressure reduction in the upper part of production tubing, which causes sulfur plugging (Nenry & Scott, 1994).

5.1.2 Corrosion in petroleum refining and petrochemical operations

The major corrosion problems in oil and gas processing facilities are not caused by hydrocarbons but by various inorganic compounds, such as water, hydrogen sulfide, hydrofluoric acid, and caustic. There are two essential sources of these conglomerates: feed-stock contaminants and process chemicals, including solvents, neutralizers, and catalysts (Nenry & Scott, 1994).

For practical purposes, corrosion in petroleum refineries and petrochemical plants is classified as low- and high-temperature corrosion. Low-temperature corrosion is considered to take place at temperatures below 260°C in the presence of water. The main source of low-temperature corrosion is the contaminants in crude oil. Those contaminants are water, hydrogen sulfide, hydrogen chloride, nitrogen compounds and polythionic acids (API, 1973).

Crude oils and gases that contain hydrogen sulfide are processed by most refineries (Hudjins, 1969). Hydrogen sulfide is also can be found in some feed stocks handled by petrochemical plants. This harmful chemical compound forms the black sulfide film seen in almost all refinery equipment (Ewing, 1955). Hydrogen sulfide is the main component of refinery sour waters and can cause corrosion problems in overhead systems of fractionation towers, in hydrocracker and hydrotreater effluent streams, in catalytic cracking units, in sour water stripping units, and, of course, in sulfur recovery units (Piehl, 1968).

Sulfur compounds include hydrogen sulfide, polysulfides, mercaptans, aliphatic sulfides, and thiophenes. Those contaminants, excluding thiophenes, react with metal surfaces at high temperatures forming metal sulfides, organic molecules, and hydrogen sulfide. The corrosiveness of sulfur compounds increases with accumulating temperature. Depending on a specific process, corrosion can be in the form of uniform thinning, localized attack, or erosion-corrosion (Nenry & Scott, 1994).

When it comes to high-temperature processes, corrosion is of considerable importance. Facility failures can have undesirable consequences because refinery processes at high temperatures involve high pressures as well. With crude oil streams, there is always the danger of fire when ruptures take place. That is why corrosion by different sulfur compounds at temperatures between 260 and 540˚C is a general issue in petroleum refining and petrochemical processes (Nenry & Scott, 1994).

5.2 Corrosion control mechanisms in sour systems

There are considerable numbers of corrosion detection methods. Two parameters, such as the operating conditions and chemical nature of the reservoir fluid have to be known in order to select corrosion control method properly. The correct observation and analytical solutions are also important. After necessary studies and considering pros and cons of the available control methods corrosion detection system should be chosen. The major currently available methods are given in Table 5 below, but it should be noted that there are other methods as well, such as iron and manganese counts, galvanic meters, electromagnetic flux leakage, chemical and bacteria analysis, metallurgical examination of failed equipment, simulation studies, and operating condition monitoring.

Table 5 *Corrosion control mechanisms in sour systems (Gerus, 1974)*

Weight loss coupons	*Advantages:*	*Disadvantages:*
Weight loss coupons are metal strips that are located into actual flow stream and allowed to corrode spontaneously. The coupons are scaled before installation. After some time of being in the fluid stream it is cleaned and scaled again before removal. The corrosion rate is defined by weight loss, exposure time, the dimensions of the coupon, and is measured in mm/year or g/cm^2.	•It is cheap and it does not require significant engineering maintenance.	•The relatively infrequent data is obtained; •Coupons placed on the upper part will not detect severe corrosion, as in most gathering facilities the corrosion phenomena is limited to the bottom area of the pipe wall; •Coupons in short term observation periods cannot indicate corrosion rate.
Radiography	*Advantages*	*Disadvantages*
Radiography is the extensively used corrosion control method. The general concept of the method is to place radioactive source on one side of a pipe and to put radiographic film on the other side, and to allow the radioactive emissions to pass through the metal. The X-ray absorption is proportional to the mass of metal that the rays pass through. Hence, the exposed film indicates pits in the pipe as dark spots.	•The actual pictorial representation of the interior of the pipe; •The inspection is held without interrupting of whole process; •The radiography is the only method which detects pitting type corrosion.	•Only specific locations can be observed; •The earth around the pipe is removed at a certain locations.
Ultrasonic inspections	*Advantages*	*Disadvantages*
Ultrasonic inspections are used to measure wall thickness by means of sound waves. The instrument consists of transducer probe which is connected to digital recording tool. The transducer transmits sound waves through the metal and receives the reflected signal.	•The large number of inspections can be made in a relatively short time; •The instrument is portable and can be used any place; •The measurements can be made without stopping the flow line.	•The extreme localization of inspection; •The shape of the corroded surface affects the sound wave reflection.
Visual inspections	*Advantages*	*Disadvantages*
Visual inspections by experienced worker are one of the most efficient methods identifying corrosion problems. While using this method pit depths can be	•Any pit depth can be measured and a pitting corrosion rate can be established; •Excellent for close observation	•Extreme localization of inspection; •Expensive for the installation of valves and bypass loops at

measured and the remaining life of the components of process facilities can be estimated.	of severely corrosive locations.	every location.
Hydrogen probe	*Advantages*	*Disadvantages*
Hydrogen probes detect the level of corrosion affected by hydrogen sulfide. The concept of the method is that atomic hydrogen diffuses through the metal probe and combines in the cavity to form hydrogen gas. The rate of gas formation detected by pressure increases within the sample and this rate is related to corrosion rate in the system.	•Fluid stream is uninterrupted	•Qualitative rather than quantitative indications •The high sensitivity of the instrument

5.3 Corrosion mitigation techniques in sour systems

Mitigation of corrosion is considered to be the final step in corrosion problems in sour systems. First of all, corrosion mechanisms should be defined and then mitigation tool is decided upon. After detection of specific corrosion mechanism, more detailed studies can be carried out, and after that the mitigation techniques can be chosen. There are a lot of mitigation techniques which is used in sour systems and following are the major ones (Gerus, 1974):

(i) Scraping and pigging

The technique of using scraping is based on removal of scale, corrosion products and other compounds from the surface of pipe wall. The scraper is a cylindrical tool with a diameter a little greater than the internal diameter of the pipe and with wire brushes and metal discs (Figure 13). Pigging is performed in the same way as scraping, but the device does not have scraping brushes or plates. The pig is usually placed in gathering line, and then



Figure 13 *Corrosion control by scraping and pigging (O'Meara, 2006)*

propelled through the system, commonly by well pressure. The disadvantage of the method is that pig launching and receiving facilities must be installed through all gathering system.

(ii) Chemical cleaning

Chemical cleaning is the injection of specific chemicals into the system for the purpose of dissolution of deposit or slug. Following removal of the solution results in clean pipe surface. Often, this method is used in combination with pigging after dissolution process is completed. The chemical cleaning is an efficient method; however, as the chemical used can react with the iron in the pipe, precautions should be taken.

(i) Corrosion inhibitors

Corrosion inhibitors injection is the mostly implemented technique to the mitigation sour oil and gas corrosion. Corrosion inhibitors are the compounds that, when introduced to the system, reduces the metal loss due to corrosion attack. These inhibitors can interfere with the anodic or cathodic reaction, moreover, can form protective barrier on the metal surface as it is shown in Figure 14. The dosage and frequency of treatment are dependent on different factors, including severity of corrosion, total amount of fluid produced, percentage of water, nature of corrodent, chemical selected, and fluid level in the casing annulus (Nenry & Scott, 1994).

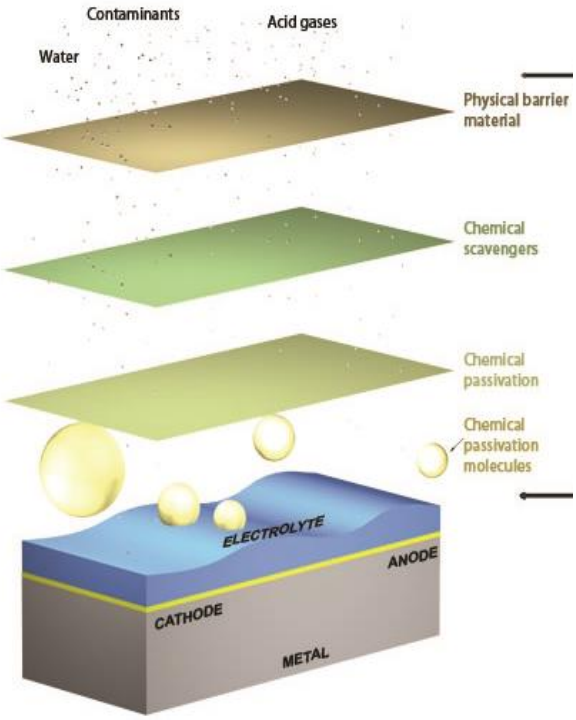


Figure 14 *Corrosion mitigation by inhibitors (ICT, 2013)*

(ii) Dew point control

Corrosion does not occur if there is no complete electrical circuit from anode to cathode. Brine water commonly provides an electrical environment in the produced fluid. So for, if the system with sour content is maintained without water or condensation the occurrence of corrosion becomes insignificant. The system which does not produce water can be

protected from water or condensation by controlling the dew point temperature. The dew point temperature can be accomplished by adding thermal energy to the system.

(iii) Biocides

The introduction of biocides into a system is right when the corrosion mechanism has been proved to be biologically induced. They are added into the system to kill the bacteria upon contacts. This results on termination of the corrosive attack on the surface.

(iv) Internal coatings and linings

This method of corrosion mitigation is extremely effective as it helps to isolate the corrosive fluid form the metal surface. The success is achieved by using coatings and linings. The coatings provide a barrier to the diffusion of reactants and the flow of electrical current. As a result, corrosion is avoided. By means coatings can be permanent and temporary. The first one is a thin sheet of corrosion resistant metal or alloy to a thicker base metal at elevated temperatures. Coatings can be formed and fabricated into transportation and process facilities. The second one is applied by the automatic machine that cleans the pipe or by hand sprayers.

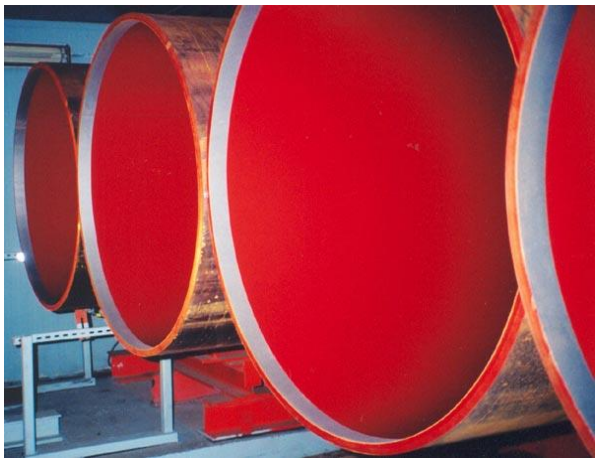


Figure 15 *Typical coated steel pipe (Offshore Technology, 2012)*

6. Petroleum products

6.1 Classification of petroleum products

The assortment of petroleum-refining industry consists of more than 500 types of gaseous, liquid and solid petroleum products in terms of their purpose. Consequently, products are difficult to place on an individual evolutionary scale. However, they can be classified in a wide variety of different ways within the oil industry (Favennec, 2001):

- Refinery operators differentiate between light products (gas and gasolines), middle distillates (kerosene, automotive gas oil and heating gas oil), and heavy products (heavy fuel oil and bitumen).
- For transportation purposes, products are distinguished as white products (motor gasoline, jet fuel, and automotive and heating gas oil) and black products (fuel oil and bitumen).

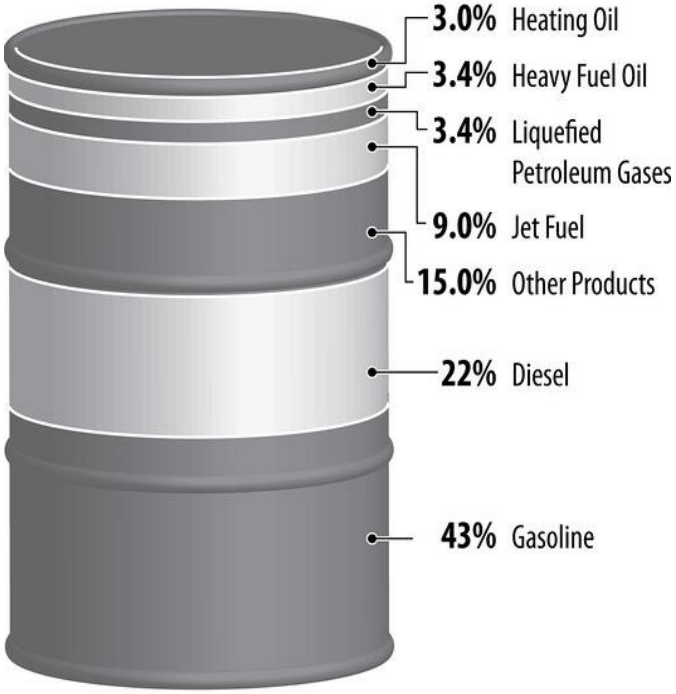


Figure 16 *Typical product produced from a barrel of oil in US (EIA, 2012)*

- Product dealers ascertain between main products and specialties. Main products are sold in a large quantities and distinction is confined so the product assortment is not considerable. Margins for main products, such as motor fuels, jet fuel, heating gas oil and heavy fuel oil, are fairly low. For sales of specialties, such as LPG, aviation gasoline, lubricants and bitumen, there is an opposite situation. They are sold in a little volume but give a high added value, both in terms of the products itself or the service provided.

7. Composition of crude oils and petroleum products

Crude oil is a unique mixture of a great number of individual chemical compounds. Each crude oil has a compound which is not matched exactly in composition or in properties by any other sample of crude oil. Chemical and physical composition of crude oil can vary not only with the location and age of the oil field, but also with the depth of the individual well. More than that, two neighboring wells may produce hydrocarbons with considerably different characteristics.

In order to understand the nature of sulfur compounds in crude oil the basic knowledge of general crude composition is needed. The main constituents present in crude oils are hydrocarbons. The hydrocarbon content may be as high as 97% by weight in light paraffinic oils or as low as 50% by weight in heavy crude and bitumen. Other non-hydrocarbon constituents include small amount of organic compounds containing sulfur, oxygen, and nitrogen, as well as compounds containing metallic elements, such as vanadium, nickel, iron, and copper (Speight, 2007). Sulfur compounds are the focus in this master thesis and will be discussed in more detail throughout subsequent chapters.

7.1 Hydrocarbon compounds

(i) Saturated Aliphatic Hydrocarbons or Alkanes or Paraffins

Alkanes are straight-chain normal alkanes and branched iso-alkanes with the general formula C_nH_{2n+2}. Alkanes are present in all crude oils. Usually, the alkane content in the oils ranges from 20 to 50%. In waxy crudes content of alkanes can be as high as 60% or even more, conversely, in low-paraffinic oils the alkane content may fall to 1.2%. If the distribution of alkanes by fractions is considered, then there is the following general pattern for all crudes: the content of alkanes decreases with increasing boiling point of petroleum fractions (Ryabov, 2009).

(i) Saturated Cyclic Hydrocarbons or Cycloparaffins or Napthenes or Cycloalkanes

Saturated cyclic hydrocarbons make up the bulk of petroleum hydrocarbons. The cycloalkane composition in crude worldwide typically varies from 40 to 70%. The

content of these hydrocarbons in some naphthenic oils can sometimes reach 80%. The distribution of cycloalkanes is essentially equal for all petroleum fractions.

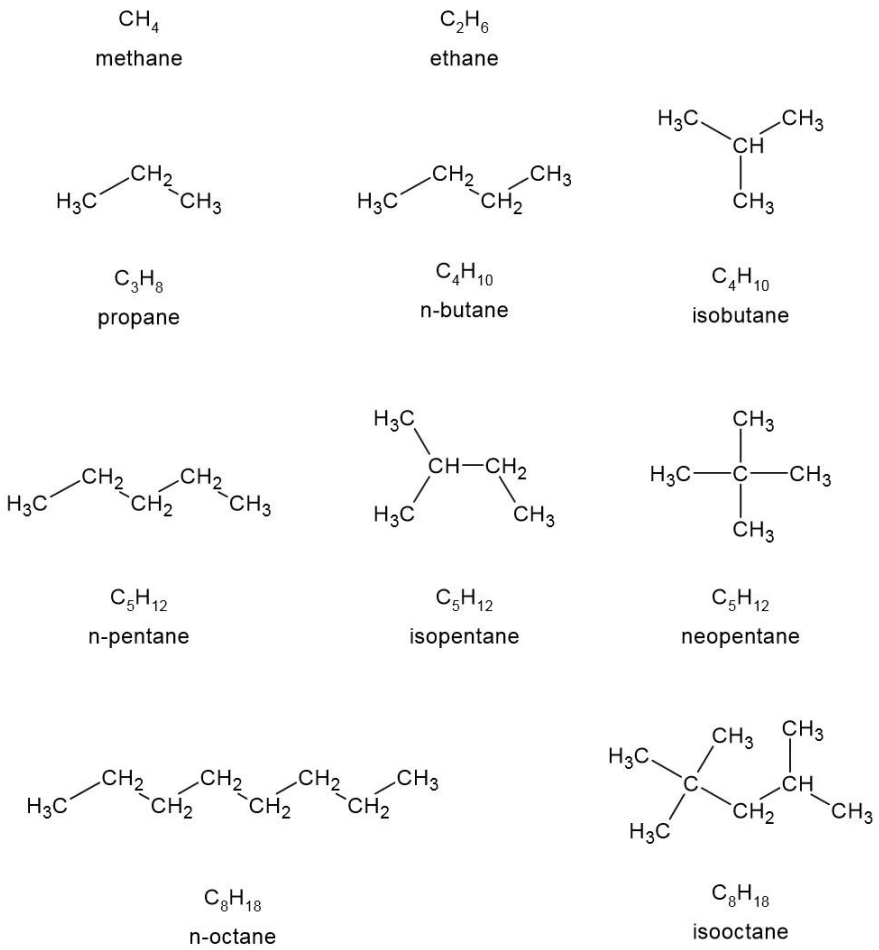


Figure 17 *Isomers of selected paraffins (Robinson, 2013)*

Although the study on chemical composition of napthenes continues for more than 100 years, those hydrocarbons, especially in high petroleum cuts, are the least understood hydrocarbons in crude oils. This is due to the complexity of their composition conditioned by a variety of isomers (Ryabov, 2009).

(ii) Aromatic Hydrocarbons

Aromatic hydrocarbons in crude oil are presented by monocyclic and polyunsaturated hydrocarbons. The content of aromatics normally ranges from 15 to 20%; in aromatic-base crude oil their content can reach as high as 35% (Ryabov, 2009). The presence in their structure of at least one ring containing double bonds significantly influences on their chemical properties. Aromatic hydrocarbons, such as benzene, toluene, and xylenes,

are primary raw materials for the petrochemical industry, moreover, they largely contributes to the octane number of gasoline. However, the negative properties of higher homologs, such as environmental and public health problems and degradation of the catalyst activity, are also known (Wauquier, 1995).

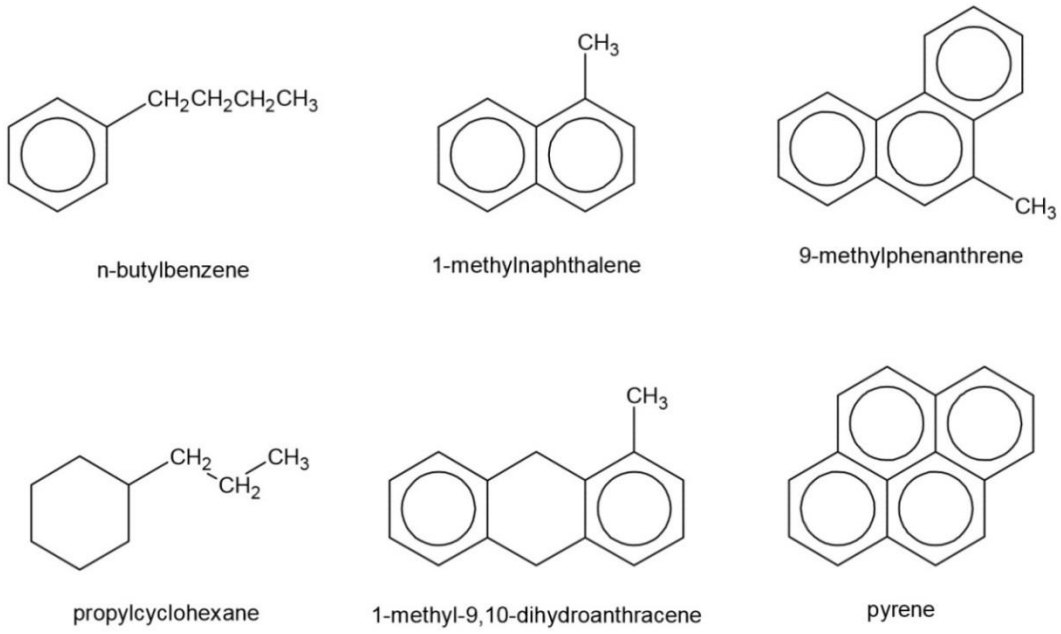


Figure 18 *Aromatics and napthenes found in crude oil (Robinson, 2013)*

(iii) Unsaturated Aliphatic Hydrocarbons or Olefins or Alkenes

The presence of olefins in crude oil has been under dispute for many years. However, evidence for the presence of significant proportions of olefins in Pennsylvanian crudes has been obtained (Speight, 2007). Next evidence is found in East Siberian and Tatar crude oils where the content of olefins can be in range of 15-20% (Ryabov, 2009). Even though, those findings are assumed as a few special cases.

In spite of previous facts, olefins are found in refining products, especially in the fractions coming from conversion of heavy fractions. The first few substances of these chemical compounds are very important feedstock materials for petrochemical industry: ethylene, propylene, and butenes (Wauquier, 1995). Selected light olefins are presented in Figure 19.

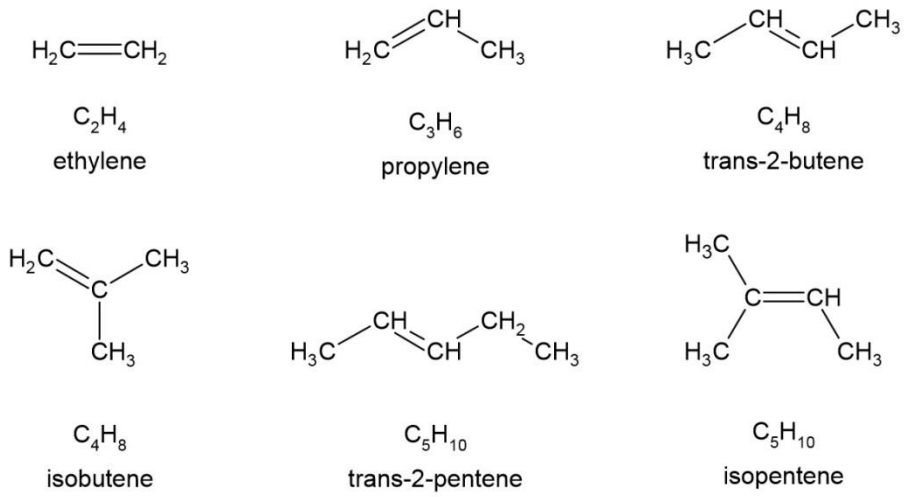


Figure 19 *Selected light olefins (Robinson, 2013)*

7.2 Non–Hydrocarbon compounds

(i) Heteroatomic Organic Compounds

Crude oils contain considerable amounts of organic non-hydrocarbon constituents. Those constituents when present in organic compounds, atoms other than carbon and hydrogen are called hetero-atoms. Sulfur-, nitrogen-, oxygen- containing compounds (Figure 20) appear throughout the entire boiling range, but tend to concentrate mainly in the heavier fractions (Speight, The Refinery of the Future, 2011).

Although they are minor constituents of crude oil, their influence on processing costs can be major. Some of the sulfur and nitrogen compounds that present problems to oil refiners. When burned in vehicles or power plants, high-sulfur fuels cause acid rain. For many refining processes, sulfur is a catalyst poison. Nitrogen is also catalyst poison. Therefore, refiners devote a considerable amount of time and money to remove hetero-atoms from intermediate streams and finished products.

(i) Organometallic compounds

In the heaviest fractions such as resins and asphaltenes organometallic compounds such as nickel and vanadium are found and their concentrations have to be reduced to convert the oil to transportation fuel. The level of metal compounds ranges from few parts per million to 200 ppm for nickel and up to 1200 ppm for vanadium.

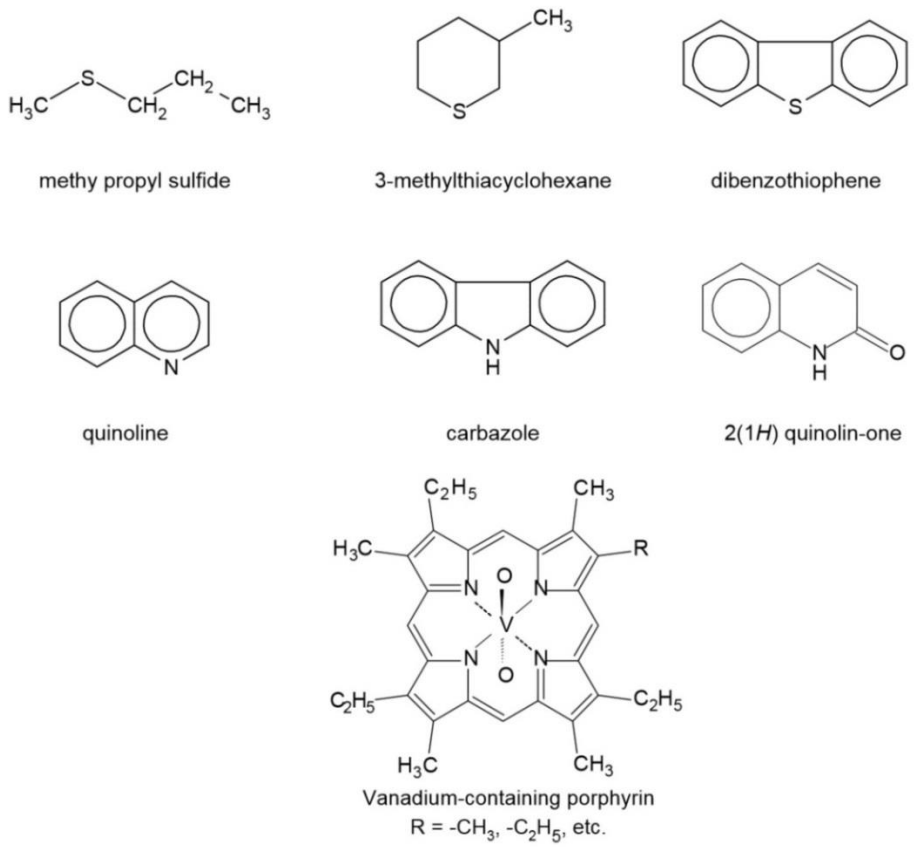


Figure 20 *Hetero-atom compounds found in crude oil (Robinson, 2013)*

8. Sulfur content of crude oils

8.1 Origin of sulfur

Sulfur in crude oil comes generally from the decomposition of organic matter, and with the passage of time and of gradual settling into strata, the sulfur segregates from crude oil in the form of hydrogen sulfide that appears in the associated gas, some portion of sulfur stays with the liquid. Another theory behind origin of sulfur compounds is the reduction of sulfates by hydrogen by bacterial action of the type desulforibrio desulfuricans:

$$4H_2 + SO_4^{=(bacteria)} \rightarrow H_2S + 2OH^- + 2H_2O$$

Hydrogen comes from the reservoir fluid and the sulfate ions are kept in the reservoir rock, as a result hydrogen sulfide is generated. The H_2S formed can react with the sulfates or rock to form sulfur that remains in composition of crude as in the case of oil from Goldsmith, Texas, USA. Moreover, under the conditions of pressure, temperature and period of formation of the reservoir H_2S can react with the hydrocarbons to give sulfur compounds (Wauquier, 1995):

$$3H_2S + SO_4 \rightarrow 4S + 2OH^- + 2H_2O$$

Sulfur compounds are among the most important non-hydrocarbon heteroatomic constituents of petroleum. There are significant amount of sulfur species found in crude oil and sulfur compounds of one type or another are present in all crude oils. Furthermore, only preferred type of sulfur exist in any particular crude oil, and this is dictated by the prevailing conditions during the formation, maturation, and even in situ alteration.

In general, the higher the density of the crude oil, the lower the API gravity of the crude and the higher the sulfur content. The total sulfur in crude oil can vary from 0.04% w/w for light crude oil to about 5% w/w for heavy crude oil and tar sand bitumen. Nevertheless, the sulfur content of crude oils which is produced from different locations varies with time, depending on the chemical composition of newly discovered fields, especially those in different geological environments (Speight, 2007).

8.2 Nature of sulfur compounds

Sulfur compounds are substances of different chemical nature, from the elemental sulfur to hydrogen sulfide and mercaptan compounds, sulfides, open-chain and cyclic disulfides, and heterocyclic derivatives of thiophene, thiophane and other more complex compounds. To date, with the exception of low molecular weight compounds, most of the sulfur compounds oils are not deciphered. Free elemental sulfur is rarely found in crude oils. The emergence of free sulfur is associated with the decomposition of more complex sulfur compounds.

The bulk of sulfur compounds found in crude oil are distributed between the heavy cuts and residues (Table 7) in the form sulfur compounds of the napthenophenanthrene or naphthenoanthracene type, or in the form of benzothiophenes, that is molecules having one or several naphthenic and aromatic rings that usually contain a single sulfur atom (Wauquier, 1995).

Table 6 *Sulfur content of selected crude oils (surface conditions) (Wauquier, 1995)*

Crude oil name	Country of origin	Weight % sulfur
Bu Attifel	Libya	0.10
Arjuna	Indonesia	0.12
Bonny light	Nigeria	0.13
Hassi Messaoud	Algeria	0.14
Ekofisk	North Sea (Norway)	0.18
Arabian light	Saudi Arabia	1.80
Kirkuk	Iraq	1.95
Kuwait	Kuwait	2.50
Cyrus	Iran	3.48
Boscan	Venezuela	5.40

Table 7 *Distribution of total sulfur in the different cuts of crude Arabian light (Wauquier, 1995)*

Cut	Light gasoline	Heavy gasoline	Kerosene	Gas oil	Residue	Crude
Temperature interval, ˚C	20-70	70-180	180-260	260-370	370+	-

Specific gravity, d_4^{15}	0.648	0.741	0.801	0.856	0.957	-
Average molecular weight	75	117	175	255	400	-
Total sulfur, weight %	0.024	0.032	0.202	1.436	3.167	1.80
Number of moles of sulfides/Total number of moles	1/1800	1/855	1/90	1/9	1/2.5	-

The sulfur compounds determined in crude oil are classified into six chemical groups.

(i) Free elemental sulfur S

Free elemental sulfur is rarely found in crude oil; however it can be present in a suspension or dissolved in the liquid. Sulfur, while crude oil is heated, partially reacts with hydrocarbons:

$$2RH+2S \rightarrow R-S-R+H_2S \qquad (X)$$

It is believed that determination of the presence of elemental sulfur in oil is a complex process and that any declaration of its presence has met with lack of confidence (Eccleston et al., 1992). The crude oil from Goldsmith, which is in Texas, is richest in elemental sulfur (1% by weight for a total sulfur content of 2.17%) (Wauquier, 1995).

(ii) Hydrogen sulfide H_2S

Hydrogen sulfide is a colorless, flammable, harmful gas that smells like rotten eggs (NPI, 2013). H_2S is found in reservoir gas and dissolved in the reservoir liquid (<50 ppm by weight). Often the appearance of H_2S in petroleum fractions is a consequence of thermal decomposition of organosulfur compounds (Ryabov, 2009). It is itself and the sulfur dioxide (SO_2), the product of H_2S combustion cause poisoning of humans, animals and plants.

The presence of H_2S in the reservoir crude determines the number of serious complications for production of oil, due to its high corrosiveness and toxicity. It causes corrosion of steel pipes and tanks, compressors, fittings and other surface equipment, particularly in the presence of carbon dioxide and water vapor in the feed, and under elevated temperatures. Therefore, the gas used as a fuel in industrial furnaces must not

contain hydrogen sulfide above the limit determined in each individual case. Furthermore, the presence of H_2S accelerates the formation of gas hydrates.

H_2S is mostly formed during processing operations such as catalytic cracking, hydrodesulphurization, thermal cracking and by thermal decomposition during distillation (Wauquier, 1995).

(iii) Thiols

Thiols or mercaptans are organosulfur compounds that contain a sulfhydryl group (SH), also known as a thiol group, that is composed of a sulfur atom and a hydrogen atom attached to a carbon atom. This molecular structure is what distinguishes thiols from other organic chemical compounds with an oxygen-to-carbon bond configuration. It is also what gives many high velocity thiols a persistent and highly unpleasant odor that is reminiscent of rotten eggs (Mayer, 2013).

The general formula of thiols is R – S – H, where R stands for an aliphatic or cyclic radical. S – H group is responsible for their acidic behavior. The level of thiols in crude oil is very low, if not zero. However, they may appear from other organosulfur compounds during refining operations, which is illustrated in Table 9. It should be noted that the content of mercaptans in crude varies from 0.1 to 15 % mass from total content of sulfur compounds (Ryabov, 2009).

Table 8 *Distribution of mercaptan sulfur among the different cuts of Arabian light crude oil (Wauquier, 1995)*

Nature of cut (temperature interval, ˚C)	Mercaptan sulfur, %	Total sulfur, %	% mercaptan sulfur / total sulfur
Crude petroleum	0,0110	1,8	0,6
Butane	0,0228	0,0228	100
Light gasoline (20-70˚C)	0,0196	0,0240	82
Heavy gasoline (70-150˚C)	0,0162	0,026	62
Naphtha (150-190˚C)	0,0084	0,059	14
Kerosene (190-250˚C)	0,0015	0,17	0,9
Gas oil (250-370˚C)	0,0010	1,40	<0,1
Residue (370 $^{+}$˚C)	0	3,17	0

Table 9 *Mercaptans identified in crude oils (Wauquier, 1995)*

Name	Chemical formula	Boiling point, ℃	Cut
Methanethiol	CH_4S	6	Butane Gasoline
Ethanethiol	C_2H_6S	34	Gasoline
2 methylpropanethiol	$C_4H_{10}S$	85	Gasoline
2 methylheptanethiol	$C_8H_{18}S$	186	Kerosene
Cyclohexanethiol	$C_6H_{12}S$	159	Gasoline

(iv) Sulfides

The sulfides are organosulfur compounds which can have a linear or ring structure. They are chemically neutral. The boiling points of sulfides are higher than of mercaptans for molecules of equal carbon number. Examples of sulfides identified in selected crude oils are shown in Table 10. They create the bulk of sulfur containing hydrocarbons in the middle distillates (kerosene and gas oil), where their content is equal to 50-80% of total sulfur compounds (Ryabov, 2009).

Table 10 *Sulfides identified in the crude oils (Wauquier, 1995)*

Name	Chemical formula	Boiling point, ℃	Cut
3 Thiapentane	$C_4H_{10}S$	92	Gasoline
2 Methyl – 3 thiapentane	$C_5H_{12}S$	108	Gasoline
Thiacyclohexane	$C_5H_{10}S$	141,8	Gasoline
2 Methylthiacyclo-pentane	$C_5H_{10}S$	133	Gasoline
Thiaindane	$C_7H_{12}S$	235,6	Kerosene
Thiabicyclooctane	$C_7H_{12}S$	194,5	Kerosene and gas oil

(v) Disulfides

The disulfides (general formula: R – S – S – R') are found in small quantities in petroleum fractions with a boiling point up to 300˚C. They account for 7-15% of the total sulfur (Ryabov, 2009).

The disulfides are complex chemical compounds which are difficult to separate; as a result, few have been identified:

Dimethyl disulfide (2,3 dithiobutane)

$CH_3 – S – S – CH_3$

Diethyl disulfide (2,3 dithiohexane)

$CH_3 – CH_3 – S – S – CH_2 – CH_3$

(vi) Thiophene and derivatives

Thiophene and its derivatives are neutral cyclic and temperature resistant compounds with five-membered ring. They do not dissolve in water, and their chemical properties are similar to aromatic hydrocarbons.

The first determination of thiophene and its derivatives was in 1899, and it was believed that they came from the degradation of sulfides during refining operations. That was until 1953, the year when the methyl-thiophenes were identified in kerosene from Agha Jari crude oil, Iran. The existence of those sulfur compounds was no longer doubted after the identification of benzothiophenes and their derivatives (Table 11).

Table 11 *Thiophene derivatives identified in crude oils (Wauquier, 1995)*

Name	Chemical formula	Boiling point, ℃	Cut
Thiophene	C_4H_4S	84	Gasoline
Dimethylthiophene	C_6H_8S	141.6	Gasoline and Kerosene
Benzothiophene	C_8H_6S	219.9	Kerosene
Dibenzothiophene	$C_{12}H_8S$	300	Gas oil

9. Fundamentals of refinery processing

Petroleum refineries are extensive, continuous flow industrial process plants which involves considerable capital expenditures. The crude oil is processed and refined into more used products such as petroleum naphtha, gasoline, diesel fuel, jet fuel, liquefied petroleum gas, petrochemical feedstocks, home heating oil, fuel oil, asphalt and others. Those transformations occur in a virtue of various physical and chemical processes proceeding in system units by separating feed into different petroleum fractions depending on their boiling range and carbon number distribution, and refining these fractions into finished products, afterwards (MathProInc., 2011). The overview of refining processes and operations are given in Figure 21 and Table 25.

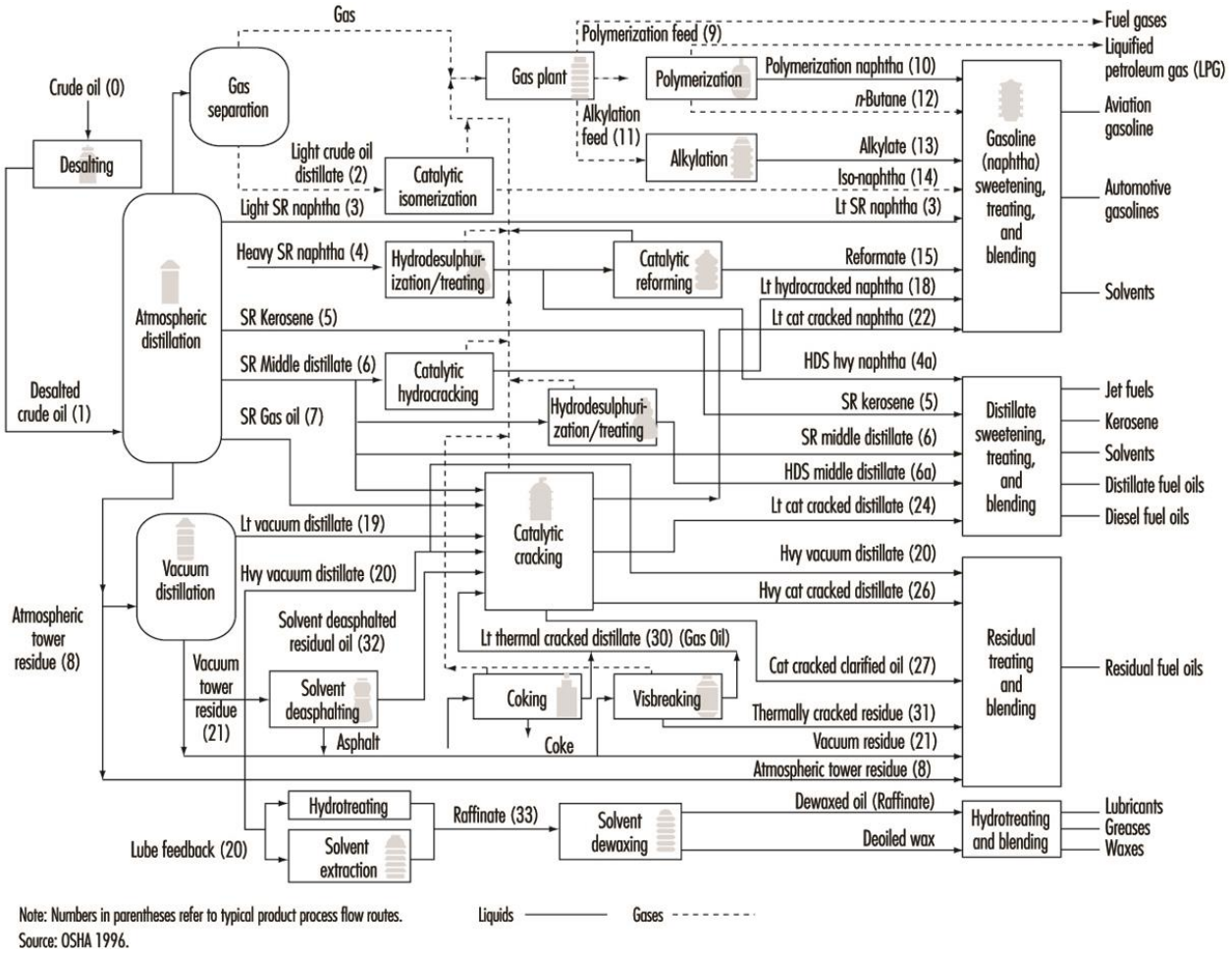


Figure 21 *Overview of refining processes and operations* (Kraus, 2011)

9.1 Classifying refineries by configuration and complexity

All refineries are unique. Their configuration and complexity differ from one refinery to another one. They have different histories, locations, preferred crude oil slate, quality specifications for refined products and market drivers. For that reason, there is no distinct classification which can group all of the possible combinations and permutations of the processes that fit together. Although no two refineries have identical configurations, they can be classified into groups of comparable refineries, defined by refinery complexity (Fahim et al., 2010):

- Simple refinery. It has atmospheric crude distillation, a catalytic reformer to produce high octane gasoline, and middle distillate hydrotreating units.
- Complex refinery. It has in addition to the units of a simple refinery, conversion units such as hydrocrackers and fluid catalytic cracking units.
- Ultra-complex refinery. The refinery has all of the units above in addition to deep conversion units which convert atmospheric or vacuum residue into light products.

The complexity of a refinery can be assessed by calculating the complexity factor. Each unit has a coefficient of complexity (CC_i) defined as the ratio of the capital cost of this unit per ton of feedstock to the capital cost of the crude distillation unit (CDU) per ton of feedstock. The complexity factor (CF_i) of the whole refinery is then calculated from the coefficients of complexity for the units in the refinery as follows:

$$CF = \sum_{i}^{N} \frac{F_i}{F_{CDU}} CC_i$$

where, F_i and F_{CDU} are the feed rate to unit i and CDU, respectively.

10. Classification of desulphurization technologies

There is no unique way of classifying the desulphurization processes. They can be categorized by the type of sulfur compound being removed, the role of hydrogen, or the nature of process used.

Crude oil desulphurization technologies can be grouped based on the nature of a key process to remove sulfur (Figure 22). First type of classification refers to the most studied and commercialized catalytic technologies, which include conventional HDS, HDS by advanced catalysts and/or by advanced reactor design, and HDS with additional chemical processes to meet the fuel specifications.

Second class of desulphurization is based on the physico-chemical processes which vary in nature from catalytic processes, including distillation, alkylation, oxidation, extraction, adsorption or combined version of these processes (Babich & Moulijn, 2003).

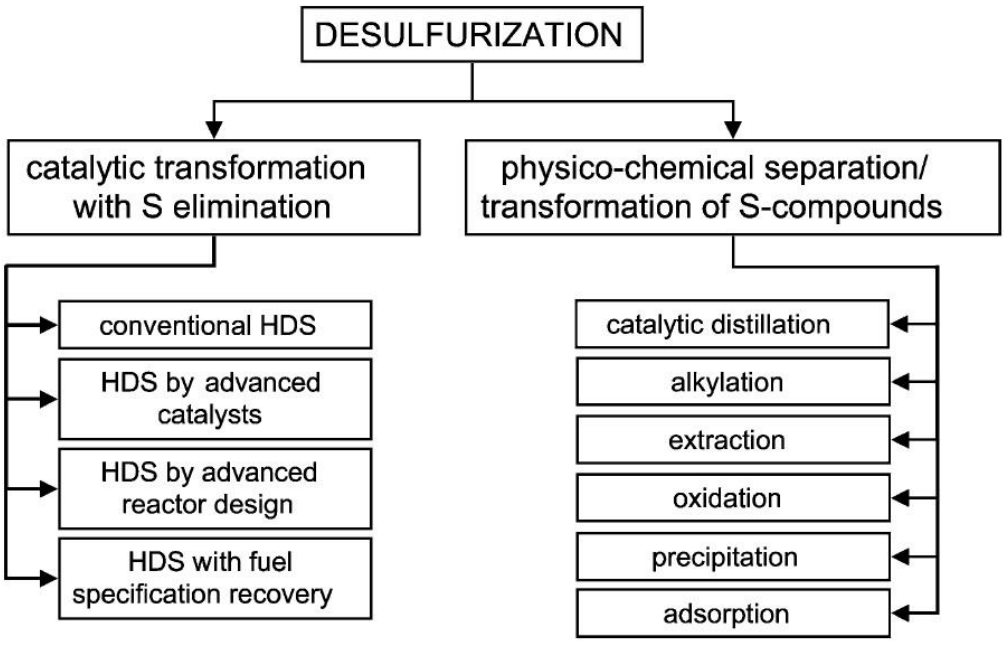


Figure 22 *Desulphurization technologies classified by nature of a key process to remove sulfur (Babich & Moulijn, 2003)*

11. Hydrotreating

Hydrotreating is a refining process in which the feedstock is treated at temperature and under pressure where thermal decomposition in the presence of hydrogen is minimized. The main purpose is to remove about 90% of undesirable contaminants including nitrogen, sulfur, oxygen, metals, and unsaturated hydrocarbons (olefins) from liquid petroleum fractions. Hydrotreating processes have been developed in connection with the increase of high sulfur heavy crude refining and more stringent quality requirements for fuels and feedstocks for catalytic processes.

Generally, hydrotreating is applied prior to processes, such as catalytic reforming and catalytic cracking so that the catalyst is not contaminated by unrefined feedstock and that organosulfur compounds are removed and middle-distillate fractions are converted into finished products such as kerosene, diesel and heating fuel oils. Furthermore, hydrogenation processes converts olefins and aromatics into aromatic compounds.

There are several important reasons for removing heteroatoms from petroleum fractions and some of them are listed below (Speight, 2007):

1. Corrosion control and mitigation while refining, handling, or use of different petroleum products
2. Compliance with the environmental regulations and laws regarding detrimental pollutants
3. Production of products with an acceptable odor and specification
4. Increasing the performance and stability of motor gasoline
5. Decreasing smoke formation in kerosene
6. Reduction of heteroatom content in fuel oil to a level that improves burning characteristics and is environmentally acceptable

Hydrogenation processes may be classified as destructive and non-destructive. Destructive hydrogenation is a single-stage or multi-stage catalytic process accompanied by the split of carbon-carbon linkages to produce low molecular weight hydrocarbons from high molecular weight fractions. Hydrogenation treatment requires severe process conditions and the use of high hydrogen pressures in order to minimize polymerization and condensation.

Non-destructive hydrogenation is commonly used for the purpose of improving product quality without considerable conversion of the boiling range. Moderate process conditions are applied so that only the more unstable materials are invaded. As a result, nitrogen, sulfur, and oxygen contaminants are exposed to hydrogenolysis to recover ammonia, hydrogen sulfide, and water, respectively.

11.1 Hydrodesulphurization

Growing dependence on heavy oils and residua has arisen, hence of sustainable decrease of conventional crude oil, due to the depletion of reserves all over the world. As a result, current trend to convert as much as possible feedstock to liquid products is causing an increase in the total sulfur in petroleum products. Hydrodesulphurization (HDS), one type of hydrotreating, is currently playing a major role in product improvement when it comes to sulfur problem, moreover it is the most widely used desulphurization technology.

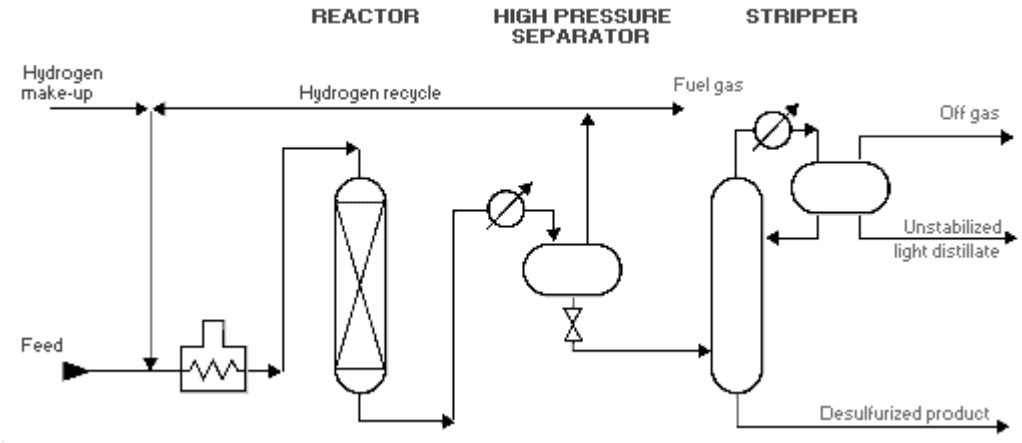


Figure 23 *Schematic of distillate hydrodesulphurization (SET Labs, 2008)*

HDS is a catalytic chemical process commonly used to remove sulfur from natural gas and from refined petroleum products such as gasoline or petrol, jet fuel, kerosene, diesel fuel, and fuel oils. The mechanism is based on reactive adsorption in which metal based adsorbents, such as $CoMo/Al_2O_3$ and $NiMo/Al_2O_3$, capture sulfur to form metal sulfides. The exhausted metal sulfide is sent to regeneration reactor and after reduction with hydrogen is again introduced into the system to remove sulfur from crude. The principal process scheme can be seen in Figure 23, and simplified flow scheme of an oil refinery with possible locations of desulphurization units is shown in Figure 24.

In an industrial hydrodesulphurization unit the hydrodesulphurization reaction takes place in a reactor unit at elevated temperatures ranging from 290 to 445 °C and elevated pressures ranging from 35 to 170 atmospheres of absolute pressure, typically in the presence of a catalyst consisting of an alumina base impregnated with cobalt and molybdenum (usually called a CoMo catalyst) (Speight, 2011). The other important process parameters, such as hydrogen recycle rate, catalyst life, the percentage of sulfur and nitrogen removal for different feedstocks are shown in Table 12.

Table 12 *Process parameters for hydrodesulphurization (Speight, 2011)*

Parameter	Naphtha	Residuum
Temperature (˚C)	300 to 400	340 to 425
Pressure (atm.)	35 to 70	55 to 170
LSHV	4.0 to 10.0	0.2 to 1.0
H_2 recycle rate (scf/bbl)	400 to 1000	3000 to 5000
Catalyst life (years)	3.0 to 10.0	0.5 to 1.0
Sulfur removal (%)	99.9	85.0
Nitrogen removal (%)	99.5	40.0

There are different recently developed technologies. For instance, ConocoPhillips created the first commercial process based on reactive adsorption utilizing nickel on zinc oxide as an adsorbent. This technology is called S-zorb and used for producing ultra-low sulfur fuel. Another research is done by Research Triangle Institute. The development is based on reactive adsorption of sulfur over Fe or Cu promoted alumina-zinc oxide. The main difference of this technology which is called TreND from S-zorb is that it does not require hydrogen nor needs just a little hydrogen (Tuli & Kumar, 2008).

11.2 Process parameters

(i) Hydrogen partial pressure

The high extent of desulphurization can be achieved with the increase of the total pressure in the system. Hence, cocking reactions will be minimized and premature aging of the remaining portion of the catalyst will not be encountered. Hydrotreating processes are carried out at a relatively high pressure of 2 – 5 MPa. Near the upper limit of the set

pressure the extent of desulphurization in connection with increasing pressure is negligible.

It was determined that the depth of desulphurization depends on hydrogen partial pressure, because the increase of total system pressure does not substantially contribute to hydrogenation processes. If the hydrogen partial pressure is too low for the selected system, the effectiveness and the service life of catalysts will be decreased. With increasing hydrogen partial pressure up to 3 MPa degree of hydrogenation of sulfur compounds increases very rapidly, and above 30 MPa very slightly (TehnoInfa, 2009).

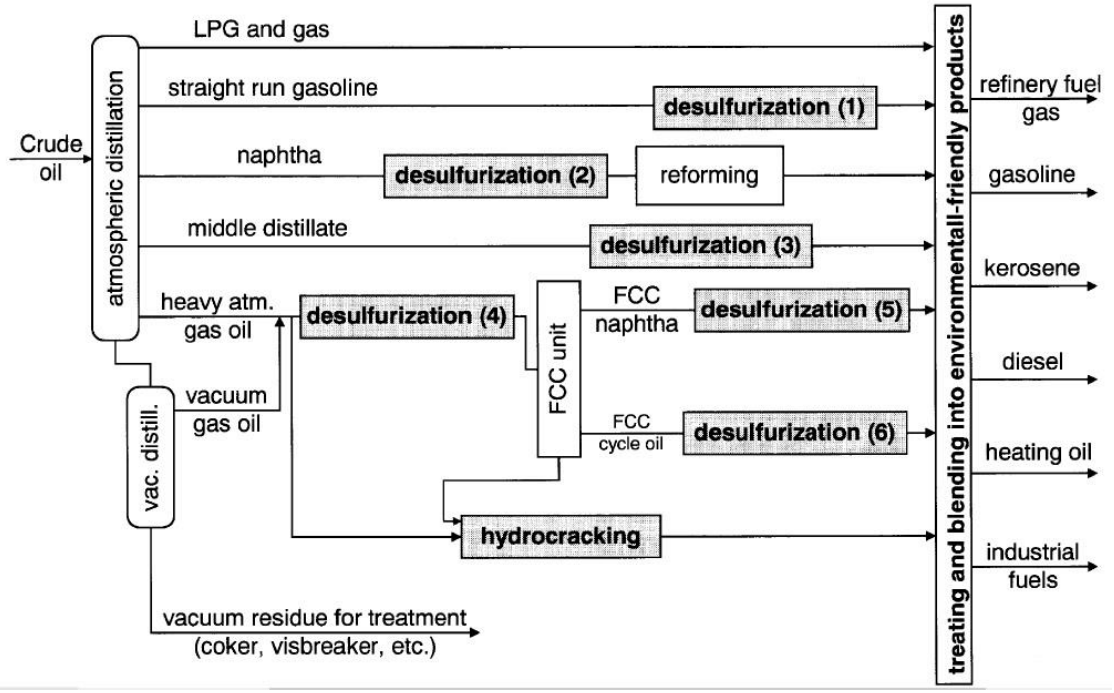


Figure 24 *Simplified flow scheme of an oil refinery with possible locations of desulphurization units (Babich & Moulijn, 2003)*

(ii) Space velocity

As the space velocity is increased, the residence time of feedstock in reactor is decreased, and vice-versa, with the decreasing space velocity the feed contact time with catalyst is increased, hence, the degree of treatment is maximized. However, the low space velocity reduces the amount of feed through the reactor causing reduced plant capacity.

Therefore, there is a maximum allowable space velocity for each feedstock, and a hydrotreatment process is precisely set to this rate.

When selecting the space velocity not only fractional and chemical content of the feed has to be taken into account, but also the state of the catalyst, as well as other process parameters (temperature, pressure) affect the rate of desulphurization (TehnoInfa, 2009).

(iii) Reaction temperature

The optimum reaction temperature depends on the feedstock quality, process conditions and the catalyst activity, and it is in the range of 340 – 400 ˚C. The rate of hydrodesulphurization increases with increasing temperature, reaching a maximum at about 420˚C.

At higher temperatures the rate of hydrogenation is reduced: for sulfur compounds - slightly, and for unsaturated and aromatic hydrocarbons - quite sharply. Consequently, this results in excessive coking reactions and premature catalyst aging rates. For that reason, units are designed to avoid the use of such temperatures (Speight, The Chemistry and Technology of Petroleum, 2007).

(iv) Catalyst life

The loss of catalytic activity is caused by several factors. In normal process conditions, the catalyst deactivation occurs gradually and continuously throughout the cycle due to coke formation, but there are a few points that explain the high rate of deactivation.

Coking occurs due to the presence in the feedstock of high-molecular compounds or by condensation of polynuclear aromatic compounds. In normal operation conditions, a high hydrogen partial pressure and a hydrogenation rate of the catalyst impede the process of coking caused by condensation reactions.

Organometallic compounds decompose and are held on the catalyst surface. Alkali metals can accumulate on the catalyst due to insufficient demineralization of feedstock or because of its contact with the salty water and additives. These metals are unregulated poisons to the catalyst.

Organic nitrogen compounds present in feedstock are converted into ammonia in hydrogenation processes. Since ammonia is a compound with basic properties, it competes with the reactants at the acid sites of the catalyst and inhibits its activity. Most

of the ammonia is removed from the reactor unit with water and, therefore, its effect on catalyst deactivation is low.

Over time, the catalyst activity decreases due to the deposition of catalyst poisons and coke on its surface. Reducing the hydrogen partial pressure in the circulating gas and the exaggeration of the process conditions contribute to coking of the catalyst.

Gradually the catalyst "ages" through recrystallization and change of the surface structure and also due to adsorption on the surface of metals and other substances that blocks the active sites. In this case, the catalytic activity significantly decreases and the catalyst is changed to the new one.

12. Unconventional desulphurization technologies

HDS operates in considerably high temperatures and pressures with hydrogen to regenerate organosulfur compounds into lighter hydrocarbons and hydrosulfides. HDS removes light organosulfur compounds, as mercaptans and thiophenes; however, when it comes to heavier sulfur mixtures like dibenzothiophene and its derivatives it is not as effective. HDS is also an expensive process, for instance, the cost of desulphurization of 20,000 barrel of oil per day is as much as $40 million. Moreover, additional hydrogen and sulfur plant capacities would double the investment into refinery plant (Johnson S. W., 1995).

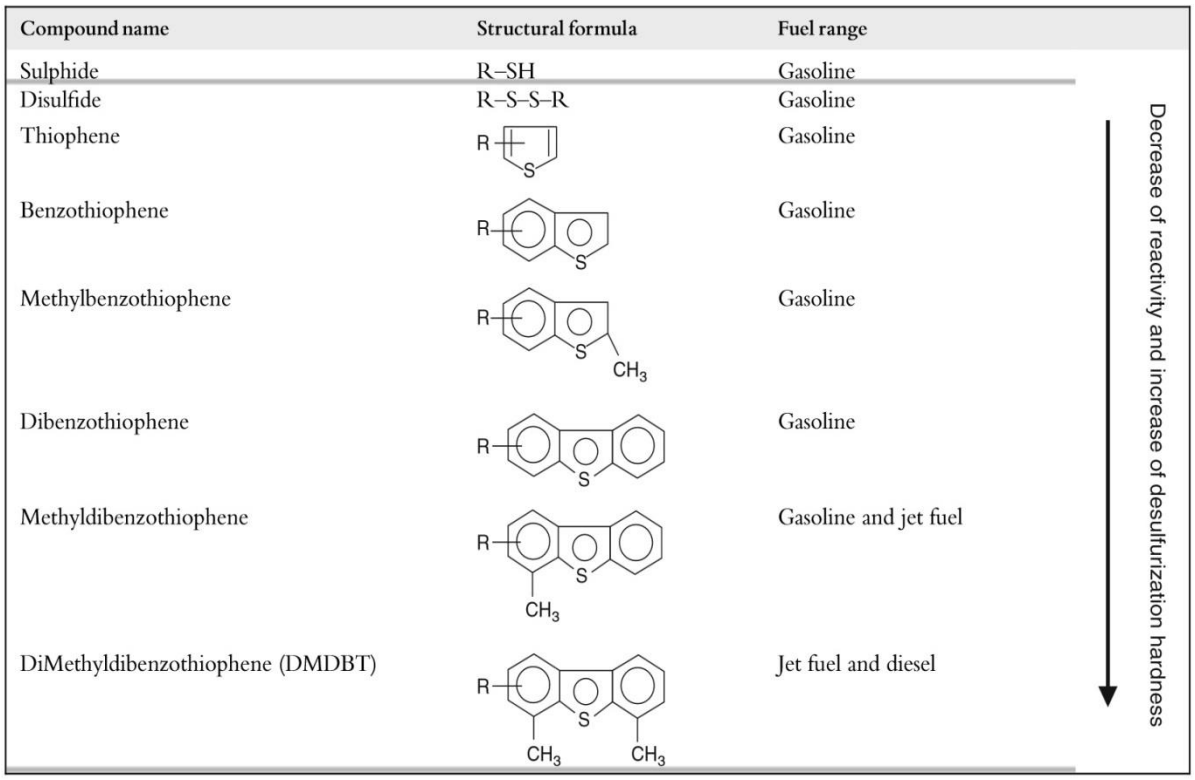


Figure 25 *Reactivity of various organic sulfur compounds in HDS versus their ring sizes and positions of alkyl substitutions on the ring (Fahim et al., 2010)*

12.1 Oxidative desulphurization

Oxidative desulphurization (ODS) is an innovative technology that can be used to reduce the cost of producing ultra-low sulfur diesel (Gatan et al., 2004). It has been in focus since 1960's. Different companies like BP, Texaco, Shell were developing suitable ODS technologies to obtain gas oil fractions with low sulfur content. Nevertheless, with more

than 80 patents granted and implied several pilot scales, no commercial plant has yet been built (Tuli & Kumar, 2008).

The basic mechanism of ODS is, first the organosulfur compounds present in middle distillate fractions are oxidized to the corresponding sulfoxides and sulfones by an oxidant (such as H_2O_2, ozone, t-butyl hydroperoxide, t-butyl hypochlorite, etc.) and then these sulfoxides and sulfones are removed from diesel by extraction, adsorption, distillation or decomposition .

ODS has more advantages comparing with hydrodesulphurization. The capital expenditure for ODS is less than for HDS as different fractions can be oxidized under low temperature and pressure conditions and expensive hydrogen is not required. It is relevant for small and medium scale refineries for the locations which are far from water pipelines as the use of hydrogen is avoided (Zongxuan et al., 2011).

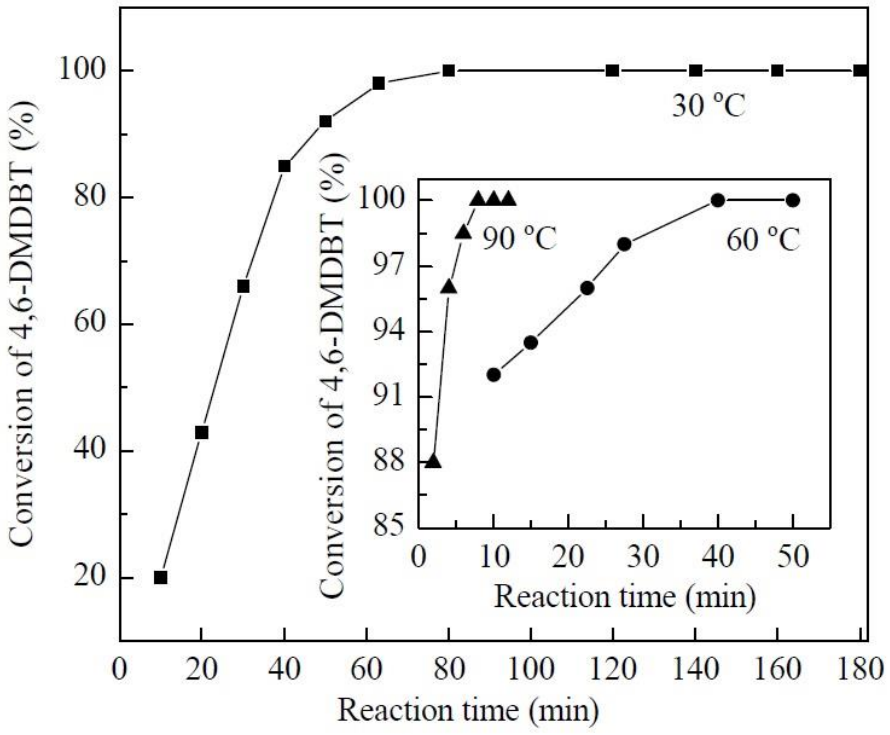


Figure 26 Conversion of 4,6-DMDBT after oxidation with H_2O_2 as a function of reaction time at different reaction temperatures under mild conditions (Zongxuan et al., 2011)

12.2 Biocatalytic desulphurization

The increasing global levels of sulfur content in crude oil have motivated the development of alternate desulphurization technologies. Microbial desulphurization or biodesulphurization (BDS) has gained interest due to the ability of certain biocatalysts to desulfurize compounds (benzothiophene, dibenzothiophene and its derivatives) that are recalcitrant to the currently employed hydrodesulphurization technology.

BDS is a relatively new technological process used to remove sulfur compounds from the crude oil. Special protein-based biocatalysts are needed for BDS. The general idea of BDS is to bring air, whole cell, oil and water into intimate contact, and to produce desulfurized oil stream free of water and biocatalyst cell in a continuously fed, well stirred reactor (Johnson, 1995).

Complex organosulfur compounds, such as dibenzothiophene (DBT) and alkyl DBT, go through different pathway in order to be transformed into more reactive compounds. This pathway is called a sulfur specific desulphurization pathway or simply 4S route. The microorganisms involved in this process are rhodococcus, bacillus, corynobacterium and anthrobacter. The reaction scheme of 4S route is shown in Figure 29 and involves four continuous reaction steps: (i) DBT is oxidized to DBTO (DBT sulfoxides), (ii) DBTO is transformed to DBT sulfones ($DBTO_2$) and (iii) to sulfonate (HPBS), (iv) hydrolytic cleavage to 2-hydroxybiphenyl (2-HBP) and following releases of sulfite or sulfate.

The strong side of BDS is that technology requires less energy and hydrogen. The process is held under ambient temperature and pressure with high selectivity, resulting in decreased energy costs, low emission, and no generation of undesirable side products (Mohebali, 2008).

A conceptual process flow diagram of the BDS process is illustrated in Figure 27. Critical aspects of the process include reactor design, product recovery and oil–water separations. Important new concepts include the use of multiple-staged airlift reactors to overcome poor reaction kinetics at low sulfur concentrations and reduce mixing costs, and the concept of continuous growth and regeneration of the biocatalyst in the reaction system, rather than in separate, external tanks (Monticello, 2000).

12.2.1 Process aspects

Several parameters are substantial in development of BDS process, and the biocatalyst activity is the main one. Other parameters include oil/water ratio, composition of aqueous phase used for biocatalyst suspension during sulfur removal, biocatalyst loading, oil water separation, biocatalyst recycle, recycle of aqueous phase to reduce fresh water usage, and secondary oil separation and purification operations.

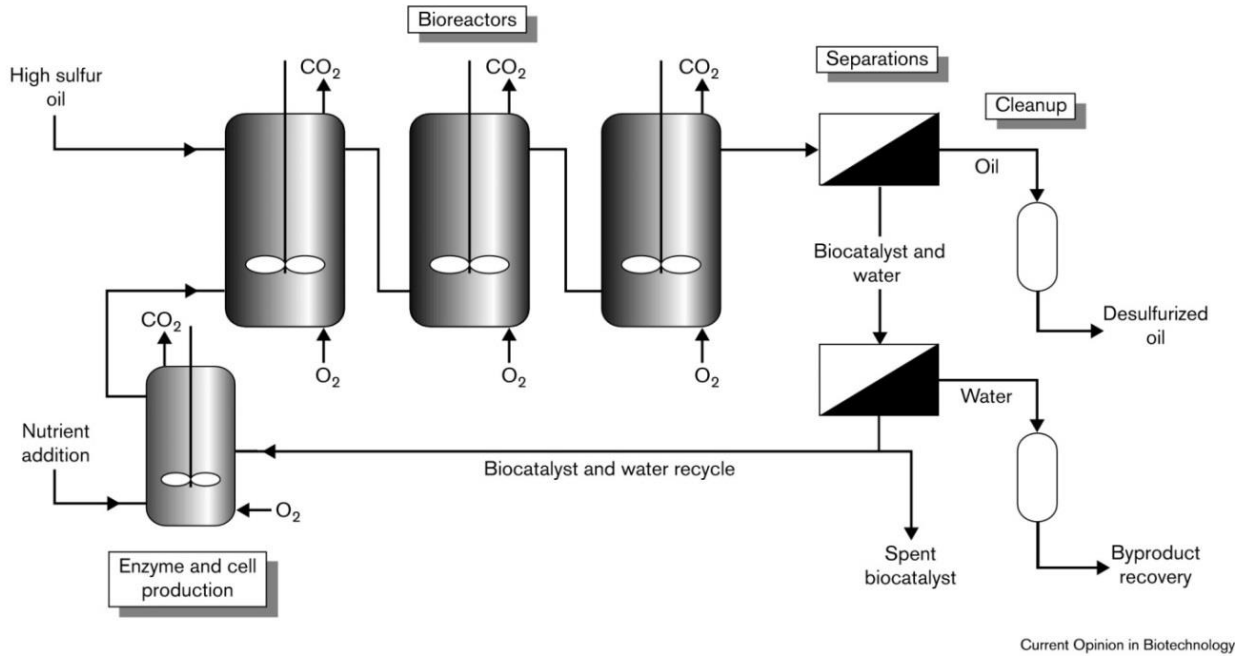


Figure 27 *Conceptual flow diagram for the BDS process (Monticello, 2000)*

A common BDS technology is held in the following steps (Ramirez-Corredores & Borole, 2007):

- Vegetation of the biocatalyst in a fermentative process using appropriate carbon and sulfur sources and other nutrients
- Separation of the biomass from the culture medium
- Use of the biomass as a catalyst for the desulphurization reaction, usually carried out in a completely stirred reactor and in the presence of large quantities of water (at least 1/3 water/oil (W/O) volumetric ratio)
- Separation of the aqueous, oil, and biocatalyst (solid/biomass paste) phases
- Recycling of the biomass paste, to the desulphurization reactor after regeneration /addition of fresh biocatalyst

- Secondary recovery of biocatalyst from the aqueous phase (via filtration, etc.)
- Removal of sulfate via precipitation by lime addition or using other salts
- Removal of the residual water from the desulfurized oil phase (e.g., using high-efficiency separators such as electrostatic separators)

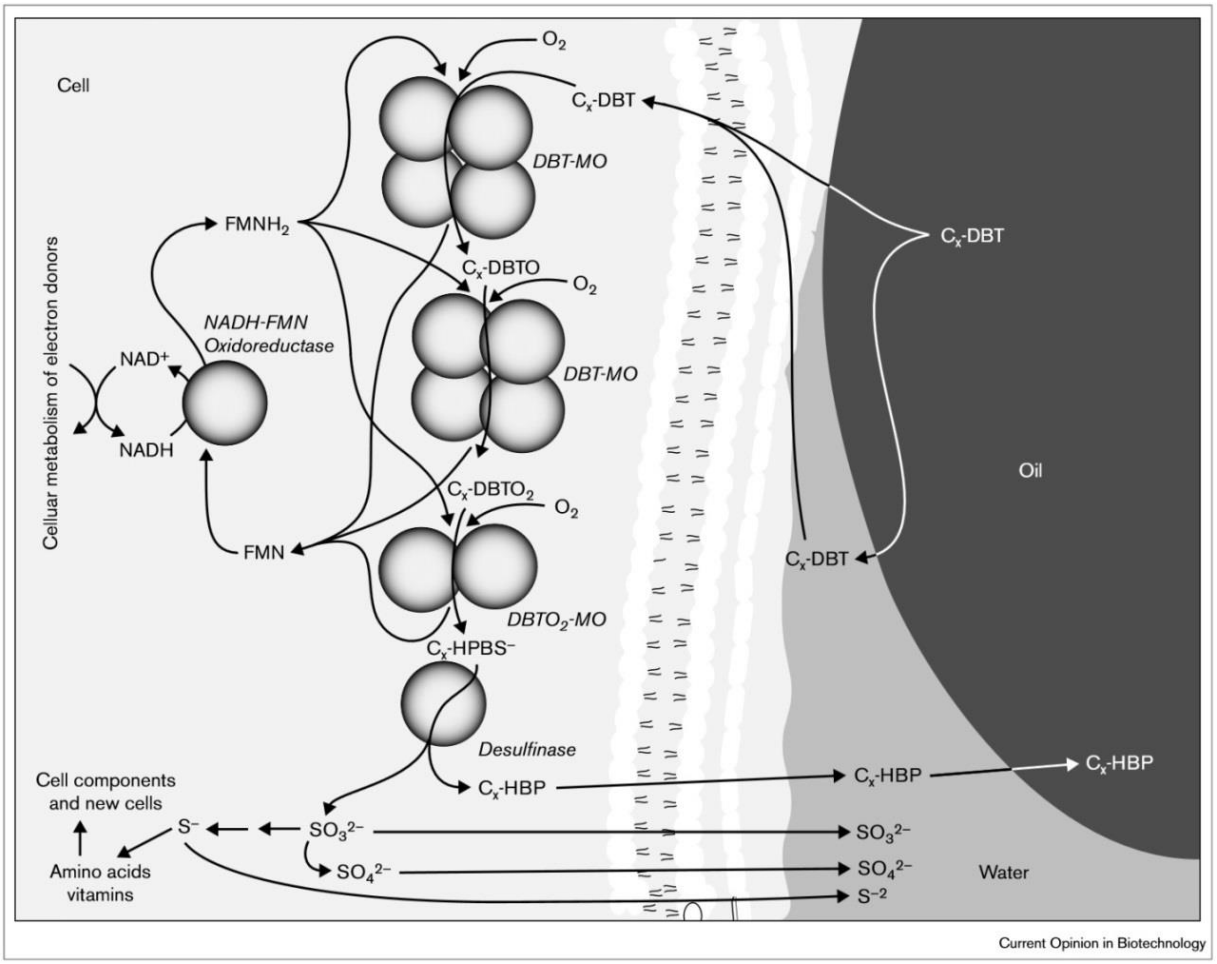


Figure 28 *Conceptual diagram of some of the steps in the desulphurization of oil (Monticello, 2000)*

12.2.2 Barriers for commercialization

Biodesulphurization capital costs are approximately 40-50$ million, which is about half that for hydrodesulphurization. Also operating costs are 15% less. Even though, BDS has certain barriers to use this technology in an industrial scale (Tuli & Kumar, 2008).

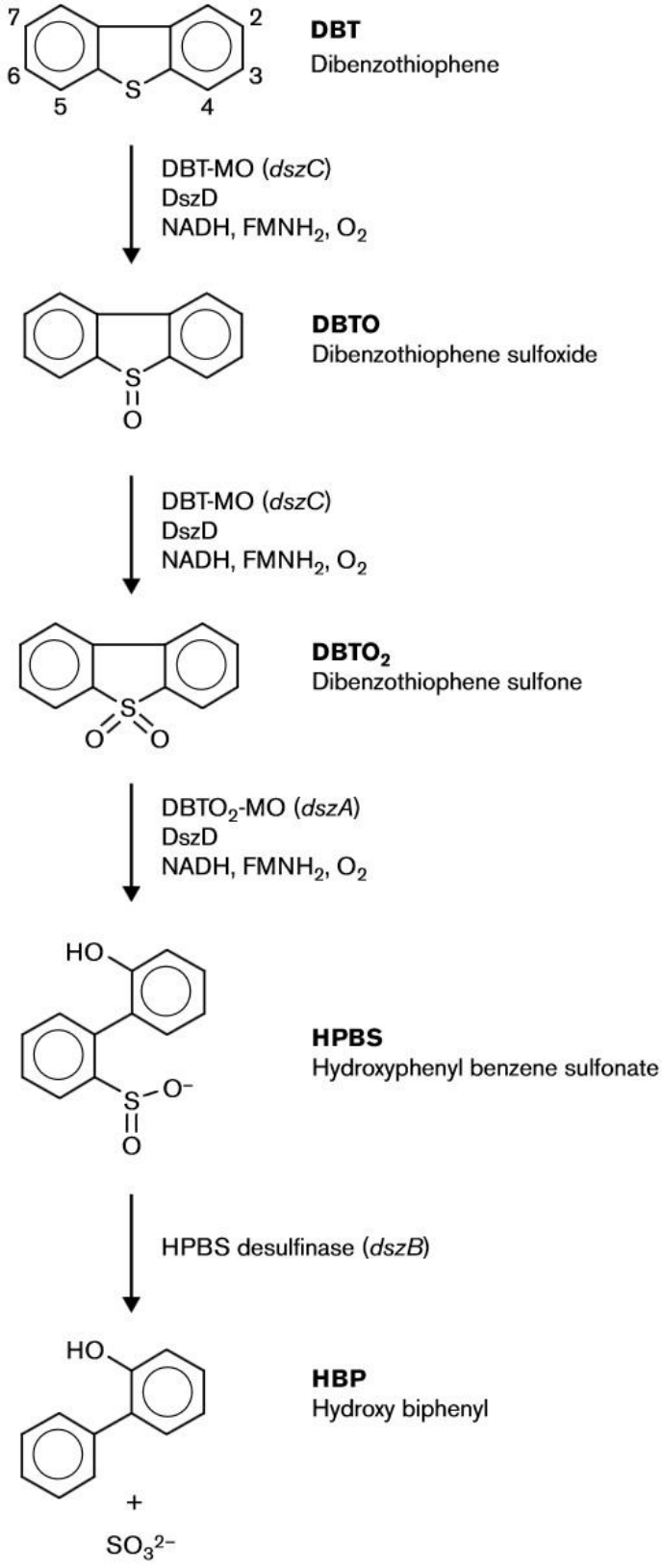


Figure 29 *The "4S" pathway for the biological desulphurization of dibenzothiophene and its derivatives (Monticello, 2000)*

(i) Biocatalyst longevity improvement

First barrier for commercialization of BDS is the biocatalyst longevity. This problem is related to the logistics of sanitary handling, shipment, storage and use of living bacterial strains within the production site and refinery units. The original BDS technology had the acceptable catalyst longevity around 1-2 days. Contemporary design includes production and regeneration units within the BDS process, with the longevity in the range of 200-400 hours (McFarland, 1999). However, highly active and stable biocatalysts adapted to the extreme conditions encountered in petroleum refining have not yet found.

(ii) Poor catalyst selectivity

Poor catalyst selectivity is another problem. Despite the significant progress in improving the technology, organisms that would remove organic sulfur from crude are not selective enough for sulfur compounds and they can remove or destroy the certain amount of hydrocarbons in process. Over the last two decades several research groups have attempted to isolate bacteria capable of efficient desulphurization of oil fractions (Mohebali & Ball, 2008).

(iii) Reactor design

Lack of good reactor design is the next barrier. Several reactor design researches led to advanced process conditions that reduced the influence of mass transport limitations, making the higher volumetric reaction rates possible. Up to date BDS reactors utilize staging, air sparging, and media optimization, hence this reduces the reactor size. However, this also requires downstream processing modifications for emulsion breaking. Moreover, the difficulty of separations increased with increased biocatalyst concentrations due to particle stabilized emulsions (McFarland, 1999).

(iv) Phase contact and separation

Generally bacterial species are responsive to organic solvents. The progress in research of stable and active microorganisms in the presence of non-aqueous solvents is desirable in crude oil fractions upgrading by BDS. In the BDS bioreactor, a limiting factor is the transport rate of the sulfur compounds from the oil phase to the bacterial cell membrane.

Efficiency of sulfur removal is likely to be related to oil droplet size. Therefore, access to organic sulfur by resting cells requires the costly dispersal of the oil fraction in the aqueous phase. The effects of surfactants on bacterial desulphurization of DBT have been investigated in biphasic (oil–water) systems; biodesulphurization has been enhanced by addition of surfactants. It has been suggested that these conditions favored more effective contact between the biocatalyst and the hydrophobic substrate. One problem, which has yet to be resolved, is whether the chemical surfactants would be toxic to the process organisms or act against the characteristic adhesion mechanisms of the bacteria to oil droplet surfaces (Mohebali & Ball, 2008).

(v) Integration to a refinery operations

Integrating a BDS into a refinery is the only way to treat petroleum fractions. Some of the options to integrate BDS units to refinery are given in Figure 30. It is very challenging to make considerable modification of current operations in a refinery. Moreover, BDS processes have to operate at the same speed and reliability as other refinery processes. As a consequence of that employing BDS as a component of refinery operations met with opposition in the petroleum industry (Kilbane & Le Borgne, 2004).

12.3 Novel combined technologies

Convenient desulphurization technologies are not perfect, and considerable work has to be done to improve process parameters and to reduce the energy consumption. Presently available technologies for sulfur removal cannot satisfy the industry requirements and cannot be complied with the market needs. New combined technologies could be one of the solutions to the existing problems.

Nowadays, a lot of novel combined technologies for desulphurization of crude are being reviewed, including the hydrogenation-bacterial catalysis method, the microwave-catalytic hydrogenation method, the three step Biodesulphurization-Oxidative desulphurization-Reactive adsorption (BDS-OD-RA) integrated process, conversion/extraction desulphurization, and the ultrasonic-catalytic oxidation method (Lin et al., 2010).

(i) Microwave-catalytic hydrogenation process for desulphurization

Microwave, catalysis and hydrogenation as an integrated process technology could improve the desulphurization rate and this technology is more efficient as opposed to traditional technology. In this integrated technology HDS catalyst can be regenerated with the help of microwave energy. Moreover, microwave inducement could result in higher sulfur removal effect of chemical desulphurization.

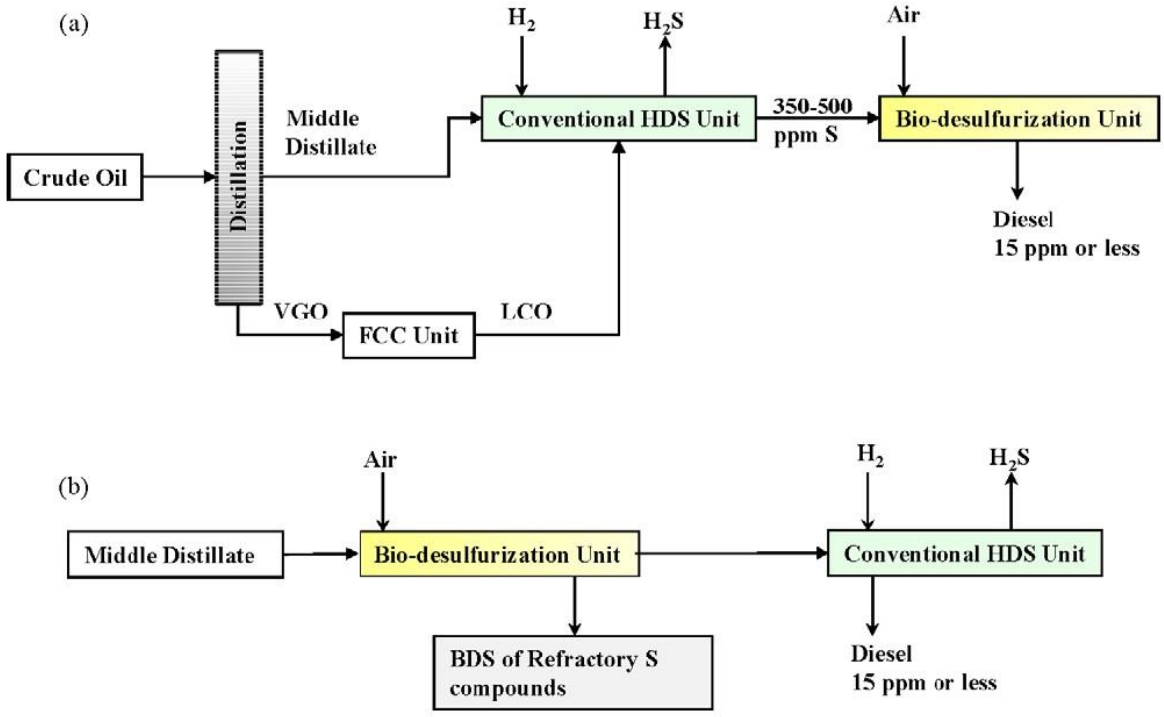


Figure 30 *Options of biodesulphurization in the upgrading of petroleum middle distillates (diesel) to ultra low sulfur levels (a) BDS unit after conventional HDS unit, (b) BDS unit before conventional HDS unit (Stanislaus et al.,2010)*

(ii) BDS-OD-RA three step integrated process

Next promising technology is the integrated BDS-OD-RA process. Generally, the process consists of three step treatment. BDS is the first step where the majority of sulfur compounds are removed, and feed is sent to the second-step treatment where it is oxidized, and finally the remaining sulfur compounds are adsorbed. However, there is a different process conditions for high-sulfur and low-sulfur crude oil in BDS step, anaerobic and aerobic conditions are used respectively.

(iii) Conversion/extraction desulphurization

Conversion/extraction desulphurization (CED) technology was originally introduced by Petro Star Inc. in 1996. It is a combined technology which includes conversion and extraction to remove sulfur compounds from middle distillate products.

The feed is mixed with a stoichiometric amount of oxidant (peroxoacetic acid) at temperatures below 100˚C and at atmospheric pressure. After the oxidation process, the fuel is sent to liquid/liquid extraction unit. It has been reviewed that in laboratory-scale experiments diesel fuel with 4200 ppm sulfur was treated to below 10 ppm sulfur (Babich & Moulijn, 2003).

(iv) Ultrasonic-catalytic oxidation method

Sonocracking™ technology was developed by SulphCo and applies ultrasound energy to efficiently oxidize sulfur compounds in a water-fuel emulsion containing a hydrogen peroxide catalyst (Babich & Moulijn, 2003). Several successful large-scale ultrasound tests have been carried out in the EU countries and it has been reported to be economically feasible (Lin et al., 2010).

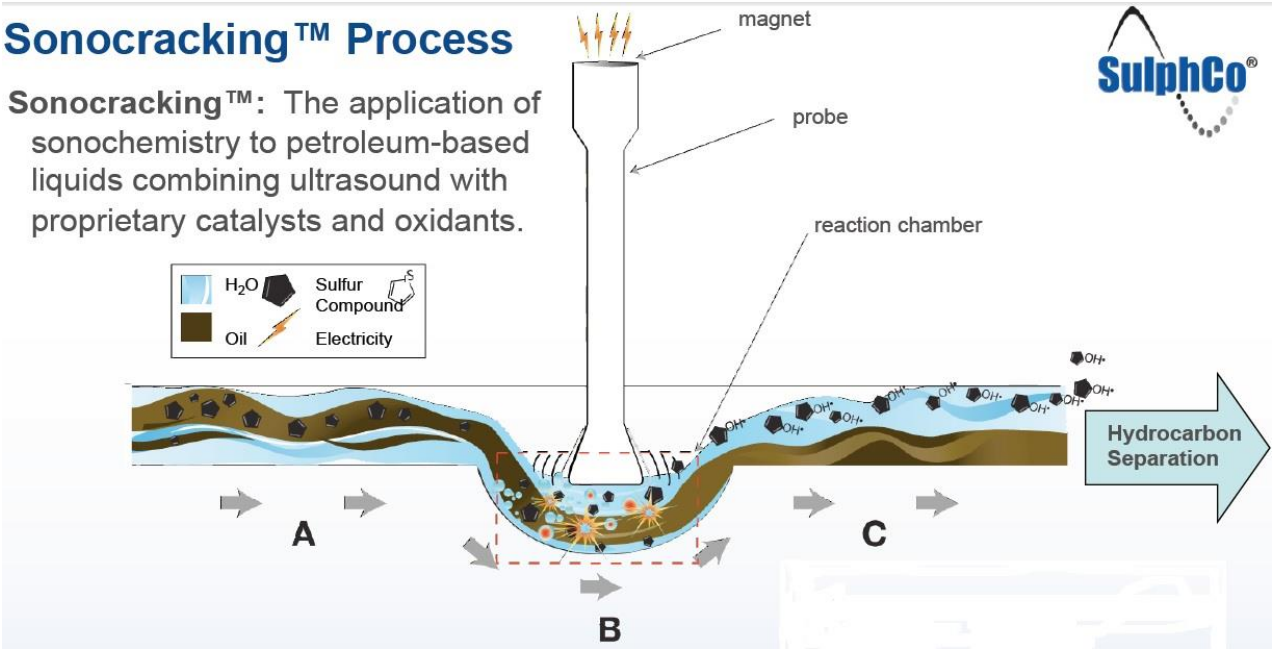


Figure 31 *Effect of ultrasound energy on oxidative desulphurization (SulphCo, 2009)*

The technology operates at 70-80˚C under atmospheric pressure and the residence time for the ultrasound reactor is reported to be only 1 minute (Babich & Moulijn, 2003). Sonocracking™ technology has many advantages, such as simple operation, low cost, low operating conditions, reduced operating cost, and high efficiency.

Graphical illustration of ultrasonic-catalytic oxidation method is given in Figure 31. Feed oil, water, oxidizing agent, and catalyst are mixed in a container and the ultrasonic wave energy is used to convert sulfides into sulfates, sulfoxides, and sulfones, which are then, can be easily removed by separation.

13. Natural gas

13.1 Associated and non-associated gas

Associated gas is a form of natural gas that is associated with the oil in the reservoir. It is also known as associated petroleum gas (APG). The term APG is usually refers to the gas dissolved in the oil; however, theoretically the gas cap is also can be included. When the oil is extracted to the surface, associated gas comes out of solution and usually separated before oil is transmitted via pipeline (PFC Energy, 2007).

Depending on the type of the reservoir, type of lift, how mature is the field, and other factors, volume and chemical content of APG varies from one case to another. When processed and separated from crude oil APG generally exists in combination with other hydrocarbons, such as ethane, propane, butane and pentanes.

Furthermore, raw natural gas contains water vapor, hydrogen sulfide and carbon dioxide, nitrogen and other compounds. Therefore, the natural gas before it is entered into gas pipeline system must be treated. After processing, APG can be utilized in a number of ways, for instance, on-site or regional electricity generation, reinjection for enhanced oil recovery, compression for sale as dry gas, or feedstock for the petrochemical industry (Røland, 2010).

As opposed to associated gas, non-associated gas is in fact never linked to another product. Commonly, industrial projects for the production and refining of this type of gases are absolutely circumscribed by the launch of regional or international markets. In a worst-case scenario, if those export routes are lacking, or because of high transportation expenses, the natural gas reservoirs can remain abandoned for a long time (Rojey et al.,1997).

13.2 Sweet and sour natural gas

Depending on the amount of sulfur compounds present natural gases are classified as sweet dry gas, sour dry gas, sweet wet gas, and sour wet gas. It is presented in Table 13. Figure 32 shows the sour natural gas reserves around the world.

Table 13 *Classification of gases by composition (composition, volume %) (Rojey et al.,1997)*

Category	1	2	3	4
Ethane and higher hydrocarbons	<10	<10	>10	>10
Hydrogen sulfide	<1	>1	<1	>1
Carbon dioxide	<2	>2	<2	>2
Standard designation	Sweet dry gas (non-associated)	Sour dry gas (non-associated)	Sweet wet gas (associated)	Sour wet gas (associated or condensate gas)

13.3 Gas sweetening processes

There is a great number of existing and economically viable gas sweetening processes, and some of them are listed below according to chemical and physical principles used (Arnold & Stewart, 1999):

1. Solid bed absorption:
   - Iron Sponge
   - SulfaTreat® (Licensor: The SulfaTreat Company)
   - Zinc Oxide
   - Molecular Sieves (Licensor: Union Carbide Corporation)
2. Chemical solvents:
   - Monoethanol amine (MEA)
   - Diethanol amine (DEA)
   - Methyldiethanol amine (MDEA)
   - Diglycol amine (DGA)
   - Diisopropanol amine (DIPA)
   - Hot potassium carbonate
   - Proprietary potassium systems
3. Physical solvents:
   - Fluor Flexsorb® (Licensor: Fluor Daniel Corporation)
   - Shell Sulfinol®

- Selexol® (Licensor: Norton Co., Chemical Process Products)
- Rectisol® (Licensor: Lurg, Kohle & Mineraloltechnik GmbH & Linde A.G.)

4. Direct conversion of H_2S to sulfur
   - Claus
   - LOCAT® (Licensor: ARI Technologies)
   - Strertford® (Licensor: Ralph M. Parsons Co.)
   - IFP (Licensor: Institute Francais du Petrole)
   - Sulfa-check® (Licensor: Exxon Chemical Co.)
5. Hydrogen sulfide scavengers
6. Distillation
   - Amine-aldehyde condensates
7. Gas permeation

(i) Solid bed absorption

Solid bed absorption processes are based on the ability of solid particles to remove acid gases through chemical reactions or ionic bonding. The general idea is that the gas stream must flow through a fixed bed of solid particles that separates the acid gases and hold them in the bed. When the solid bed reaches the end of its useful life, the vessel must be removed and replaced (Branan, 2005). Commonly, there are three main processes implemented under this type of sweetening: the iron oxide process, the zinc oxide process, and the molecular sieve process (Arnold & Stewart, 1999).

(i) Chemical solvents

In chemical solvent processes, gas streams containing the acid gases are chemically reacted with a lean solvent in an absorber. The reaction occurs due to the driving force of the partial pressure from the gas to the liquid (Arnold & Stewart, 1999). The solvent absorbs the acid gases and exits the column as a rich solution, which is then sent to a regenerator column where the acid gases are stripped from the solvent (Koch-Glitsch, 2013).

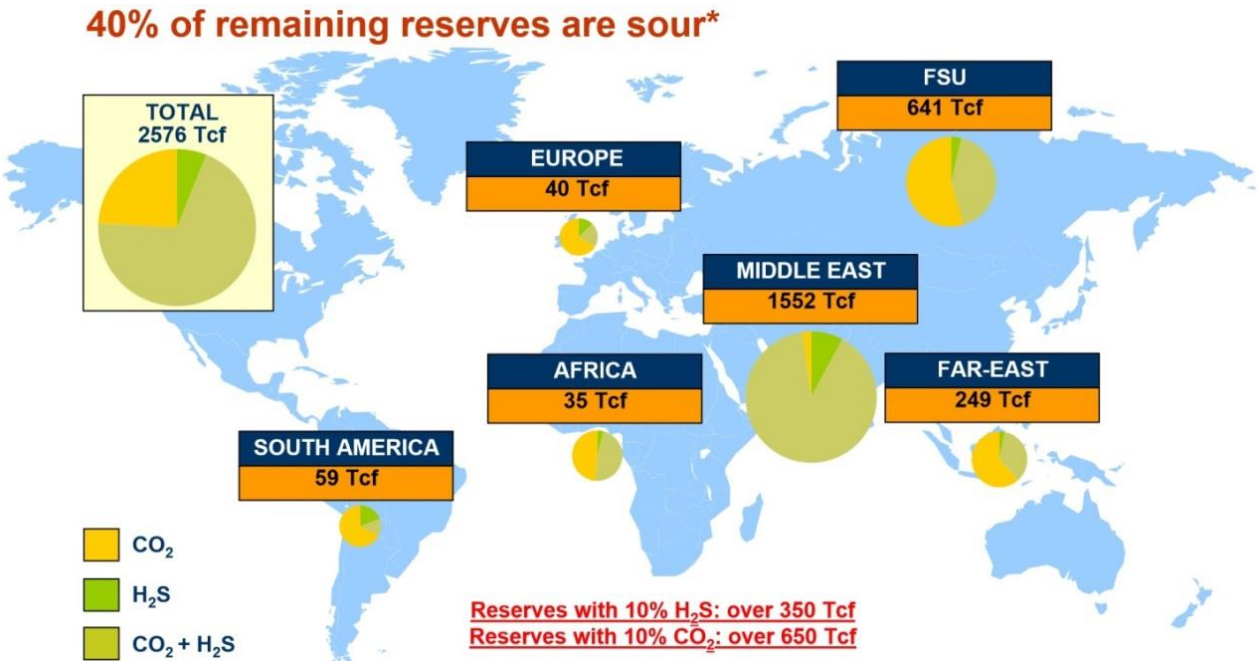


Figure 32 *Sour natural gas reserves around the world (Carrol & Foster, 2008)*

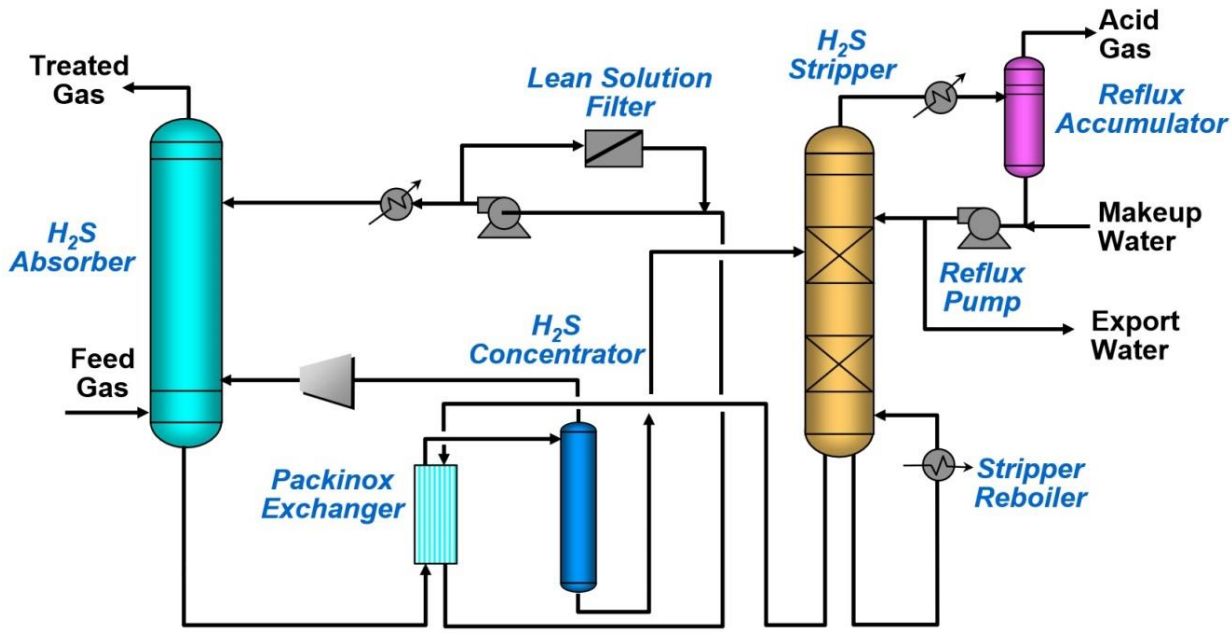


Figure 33 *Selexol® flowscheme for sulfur removal* (UOP, 2009)

(i) Physical solvents

The general idea of physical solvents processes is to use organic solvents to absorb the acid gases. There are no chemical reactions between the acid gas and the solvent, but H_2S and CO_2 is highly soluble within the solvent. Solubility reactions are firstly influenced by partial pressure, and secondarily on temperature. The physical solvent processes are highly effective under higher acid gas partial pressure and lower temperatures (Arnold & Stewart, 1999). There are a number of commercially available technologies within the petroleum industry. The flowscheme of Selexol® process is shown in Figure 33.

Table 14 exhibits the main characteristics of chemical and physical solvents, including advantages and disadvantages of these acid gas removal processes.

Table 14 *Comparison of chemical and physical solvents*

Chemical solvents

Advantages	**Disadvantages**
Relatively insensitive to H_2S and CO_2 partial pressure	High energy requirements for regeneration of solvent
Can reduce H_2S and CO_2 to ppm levels	Generally not selective between H_2S and CO_2
	Amines are in a water solution, and thus the treated gas leaves saturated with water
Physical solvents	
Advantages	**Disadvantages**
Low energy requirements for regeneration	May be difficult to meet H_2S specifications
Can be selective to H_2S and CO_2	Very sensitive to acid gas partial pressure

(ii) Direct conversion of H_2S to sulfur

Direct conversion technology is based on chemical reactions to oxidize hydrogen sulfide and to produce elemental sulfur. This technology uses the reactions of H_2S and O_2 or H_2S and SO_2. All reactions involve special catalysts and/or solvents and yield water and elemental sulfur. Several commercially available processes, such as Claus® process, LOCAT® process, Stretford® process (Figure 34), and others have been successfully used to remove H_2S from the gas stream.

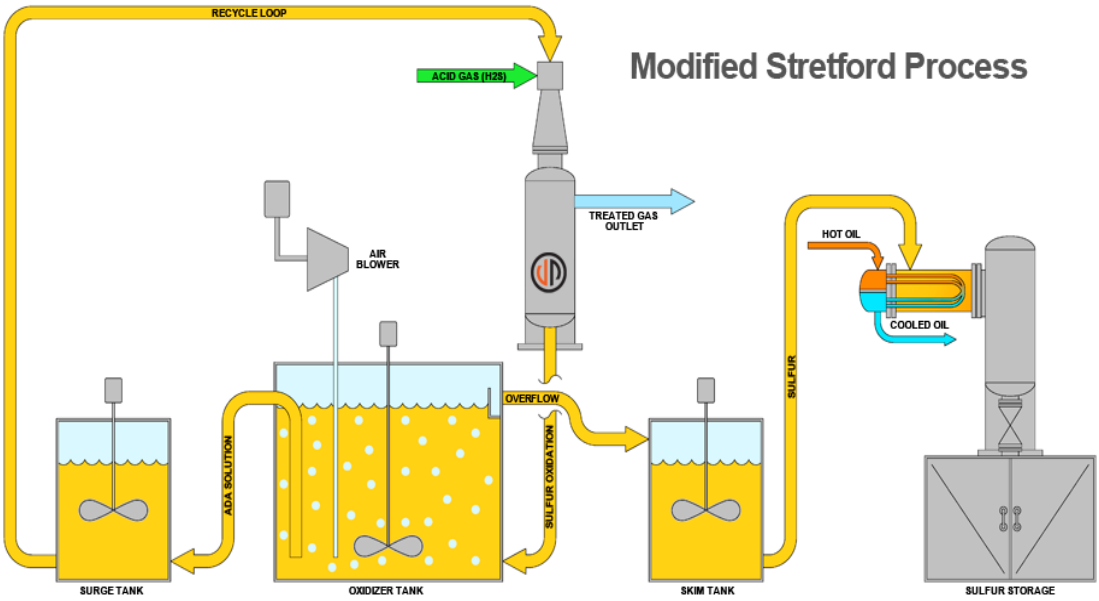


Figure 34 *Modified Stertford® process flow diagram (Joule Processing, 2012)*

It should be noted that direct conversion processes do not release harmful gases like H_2S and CO_2 to the atmosphere, as in the case of previously discussed technologies. The acid gases from chemical and solvent processes can be flared, which would cause of SO_2 release. It is known that allowable level of SO_2 is strictly regulated by environmental authorities, and these limitations are revised periodically (Arnold & Stewart, 1999).

(iii) Hydrogen sulfide scavengers

Sulfide scavengers are based on chemical reactions of commercial additives with one or more sulfide species by converting them into a more inert form. Sulfide scavengers technology is commonly carried out in a continuous sour gas stream. Different scavengers, such as amine-aldehyde condensates, are constantly injected into the system. The most critical parameter is contact time between the scavenger and the sour gas (Arnold & Stewart, 1999).

Effective hydrogen sulfide removal is achieved if there is an irreversible and complete chemical reaction between the scavenger and one or more sulfide species. Upon reaction equilibrium between the three species in solution is achieved, for that reason complete removal of one species serves to remove all three. Insufficient chemical reaction between a species and the scavenger cannot remove all soluble sulfides present (Amosa et al., 2010).

13.4 Process selection factors

Gas sweetening processes were described in the previous chapter. Each of these processes has favored position comparing with others for various cases; hence the following process selection factors should be considered (Kidney & Parrish, 2006):

- The type of acid contaminants present in sour gas stream;
- The concentration of impurities and amount of heavy hydrocarbons and aromatics in the sour gas. For example, COS, CS_2, and mercaptans can affect the design of both gas and liquid treating facilities. Physical solvents tend to dissolve heavier hydrocarbons, and the presence of these heavier compounds in significant quantities tends to favor the selection of a chemical solvent;
- The volume of gas to be treated the temperature and pressure at which the sour gas is available. High partial pressures (3.4 bar or higher) of the acid gases in the feed favor physical solvents, whereas low partial pressures favor the amines;
- The final specifications of the outlet gas;
- The desirability or selectivity required for removing one or more of the contaminants without removing the others;
- The capital, operating, and royalty costs for the process;
- The environmental constraints, including air pollution regulations and disposal of byproducts considered hazardous chemicals.

Moreover, there are different process selection charts (Figures 35-37) which could help to choose the appropriate sweetening processes. In order to do so partial pressure of acid gas in product and in feed has to be known.

14. Refinery of the future

Refinery industry has been developing significantly over the last century. This development is forced by increasing demand for automotive fuels, as well as for gas oils and fuels for domestic central heating, for fuel oil power generation, and for inputs to the petrochemical industries. The following factors have accelerated the development of new processes (Speight, 2011):

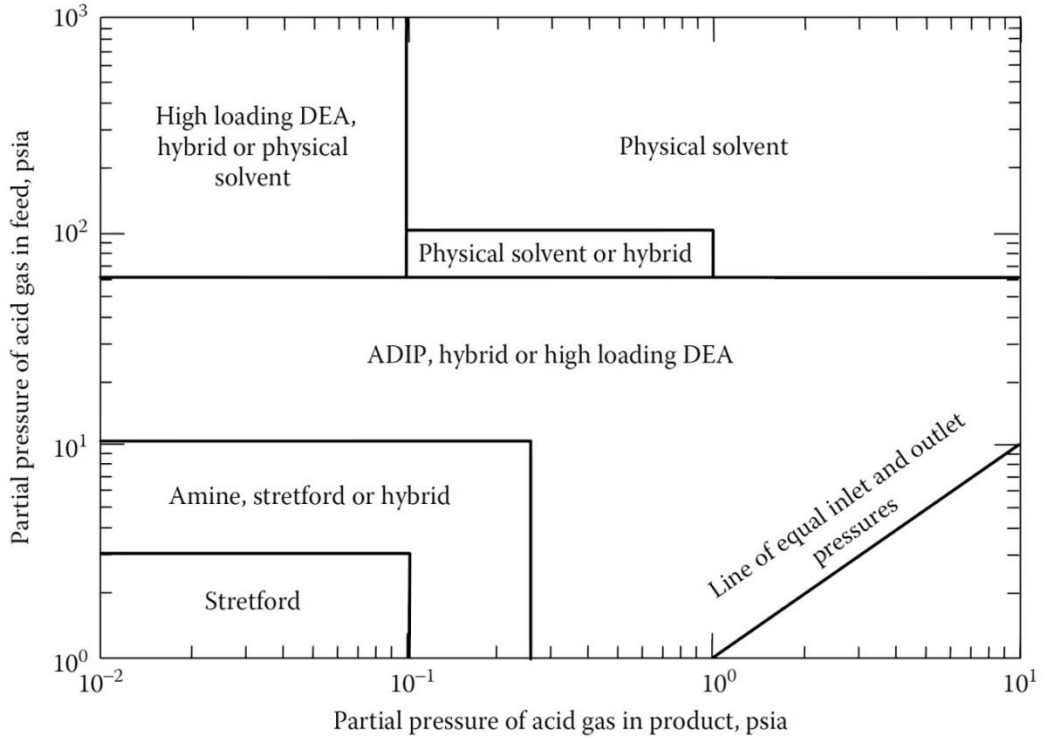


Figure 35 *Process selection chart for H_2S removal with no CO_2 present (Kidney & Parrish, 2006)*

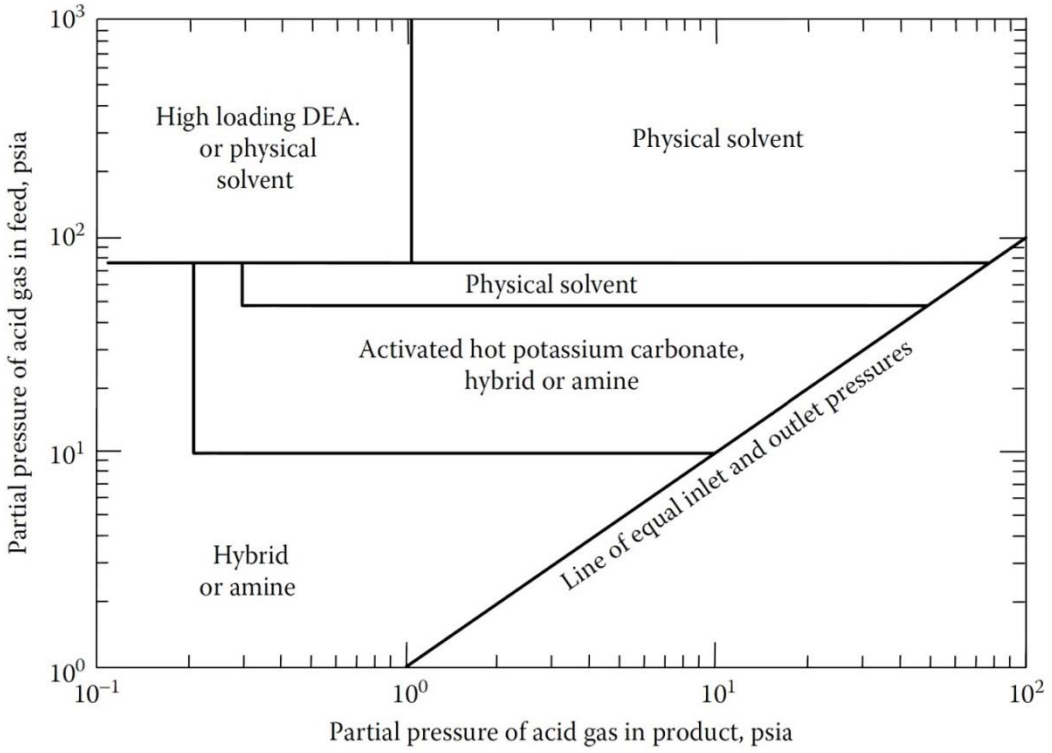


Figure 36 *Process selection chart for simultaneous H_2S and CO_2 removal (Kidney & Parrish, 2006)*

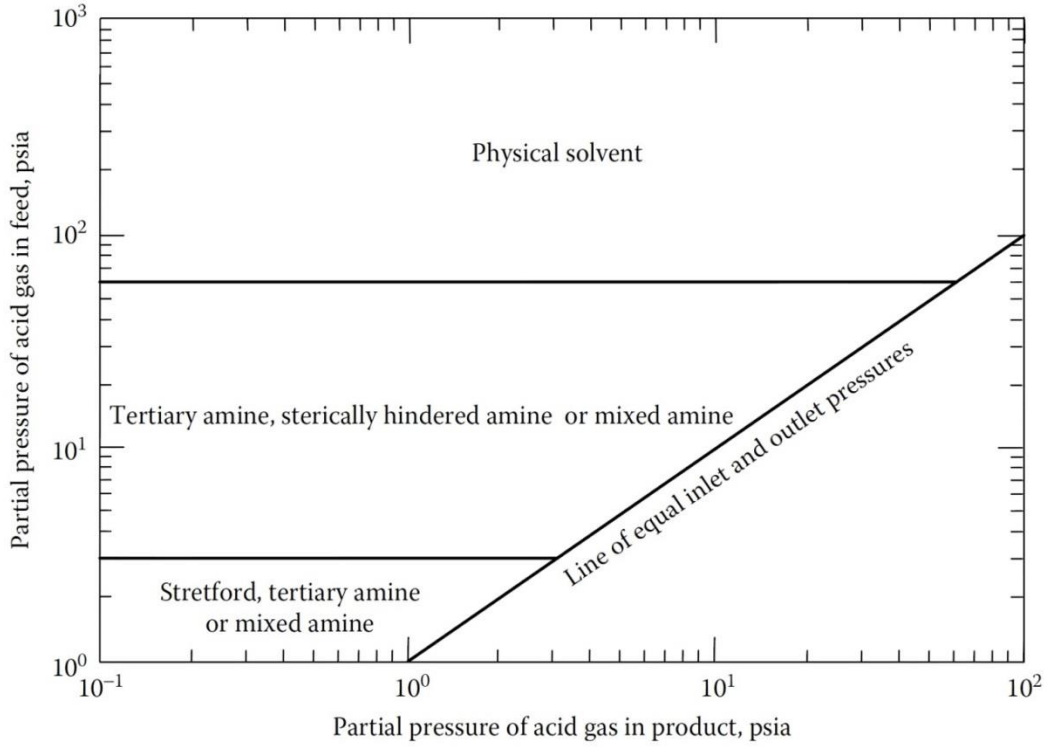


Figure 37 *Process selection chart for selective H_2S removal with CO_2 present (Kidney & Parrish, 2006)*

Table 15 *Natural gas reservoirs with a high H_2S content (Rojey et al., 1997)*

Reservoir	Lithology	Depth (m)	H_2S content (wt %)
Lacq (FRA)	Dolomite and limestone	3100 to 4500	15
Pont d'As-Meillon (FRA)	Dolomite	4300 to 5000	6
Weser-Ems (GER)	Dolomite	3500	10
Asman-Bandar Shipur (IRN)	Limestone	3600 to 4800	26
Urals-Volga (CIS)	Limestone	1500 to 2000	6
Irkutsk (CIS)	Dolomite	2540	42
Alberta (CAN)	Limestone	3506	13
Alberta (CAN)	Limestone	3800	87
South Texas (USA)	Limestone	3354	8
South Texas (USA)	Limestone	5793 to 6098	98
East Texas (USA)	Limestone	3683 to 3757	14
Mississippi (USA)	Limestone	5793 to 6098	78
Wyoming (USA)	Limestone	3049	42

- The high demand for products such as gasoline, diesel, fuel oil, and jet fuel
- Uncertain feedstock supply, caused especially by the changing quality of crude oil, by geopolitical relationships among different nations, and by the emergence of alternate feed supplies such as bitumen from tar sand, natural gas, and coal
- Recent environmental regulations that include more stringent regulations in relation to sulfur in automotive fuels
- Sustainable technological development such as new catalyst and processes

Nowadays, the average quality of crude oil has deteriorated.

To date, according to the statistical information there is a general trend towards reduction of sulfur content of fuels, and this fact will convince that the role of desulphurization increases in importance in the processing operations.

The main developments in desulphurization will follow major paths, such as:

- Advanced hydrotreating (new catalyst, catalytic distillation, processing at mild conditions)
- Reactive adsorption (type of adsorbent implemented, process design)
- Oxidative desulphurization
- Biocatalytic desulphurization
- Combined technologies

Several decades later, the need for hydrogen will be reduced, as new desulphurization technologies and evolution of the older ones are expected to be developed.

In the year 2030 the standard American refinery will be placed at an existing refinery site. That will be mainly due to economic and environmental considerations, as it will be difficult to construct the new refineries at another site. Numerous existing refineries may still be in use, but a lot of processing technologies will be more efficient and more high-tech. Moreover, the main concern for refiners will be the energy efficiency of processing units in order to reduce the cost operating expenses (Speight, 2011).

14.1 Global refinery capacity requirements in the future

Table 16 and Figures 38-40, which are taken from OPEC's annual World Oil Outlook, exhibit information on global crude distillation capacity and desulphurization capacity additions. Improvements in product quality specifications which are previously discussed will influence in considerable desulphurization capacity additions in order to reduce the sulfur level in refined products. It is known that OECD countries are already legislated ultra low sulfur regulations for automotive fuels, further development will be expected in non-OECD countries, because they are also reducing the average sulfur content to low and ultra low levels. It is forecasted that 22 mb/d of additional desulphurization capacity will be required globally by 2035. This number is the largest volume of capacity additions in the period to 2035 (OPEC, 2012).

Table 16 *Global capacity requirements by process (millions of barrels/day) 2011-2035 (OPEC, 2012)*

	Existing projects	Additional requirements		Total additions
	to 2015*	to 2015	2015–2030	to 2035
Crude distillation	**6.0**	**0.7**	**8.2**	**14.9**
Conversion	**4.7**	**1.1**	**5.8**	**11.6**
Coking/Visbreaking	1.5	0.0	0.6	2.1
Catalytic cracking	1.2	0.1	0.5	1.8
Hydro-cracking	2.0	1.0	4.7	7.7
Desulphurization	**6.2**	**3.0**	**12.8**	**22.0**
Vacuum gasoil/Resid	0.2	0.3	1.5	2.1
Distillate	4.5	2.2	8.8	15.5
Gasoline	1.4	0.6	2.4	4.4
Octane units	**1.7**	**1.3**	**2.5**	**5.4**
Catalytic reforming	1.3	1.3	1.4	4.0
Alkylation	0.2	0.0	0.1	0.3
Isomerization	0.2	0.0	1.0	1.1

The most part of desulphurization capacity additions is planned in Asia (10.4 mb/d), the Middle East (3.4 mb/d), Latin America (3.3 mb/d), and the FSU (2.9 mb/d). This is mainly due to expansion of refining base and demand for petroleum products, also tightened nationwide and exported average quality specifications. Figure 40 the data regarding desulphurization capacity additions to the main distillate groups of petroleum products. It can be seen that in the forecasting period from 2011 to 2035, more than 60%

of global desulphurization capacity additions (14 mb/d) are for the desulphurization of middle distillates, whereas 27% for gasoline (6 mb/d), and the rest for vacuum gasoil/residual fuel (2 mb/d).

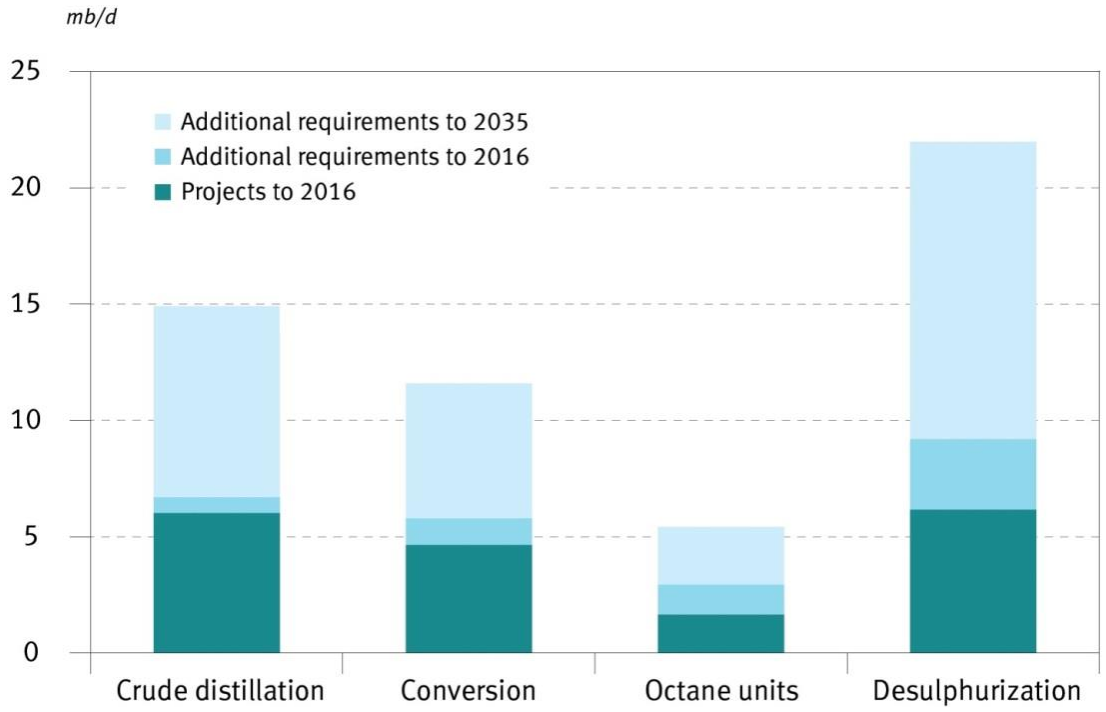


Figure 38 *Global capacity requirements by process type, 2011-2035 (OPEC, 2012)*

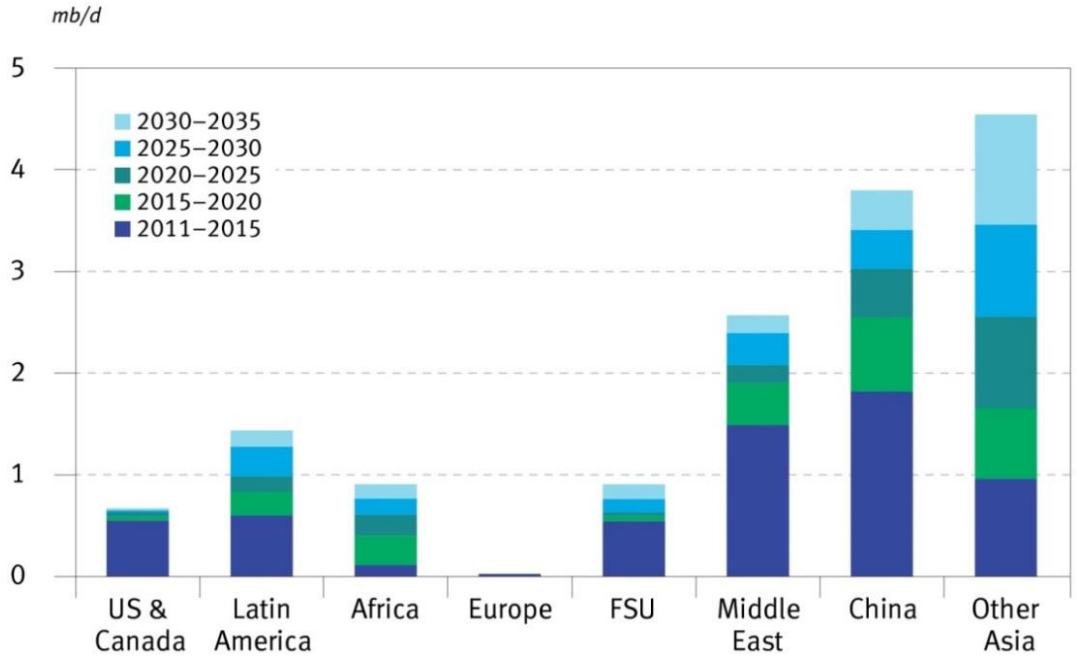


Figure 39 *Crude distillation capacity additions, 2011-2035 (OPEC, 2012)*

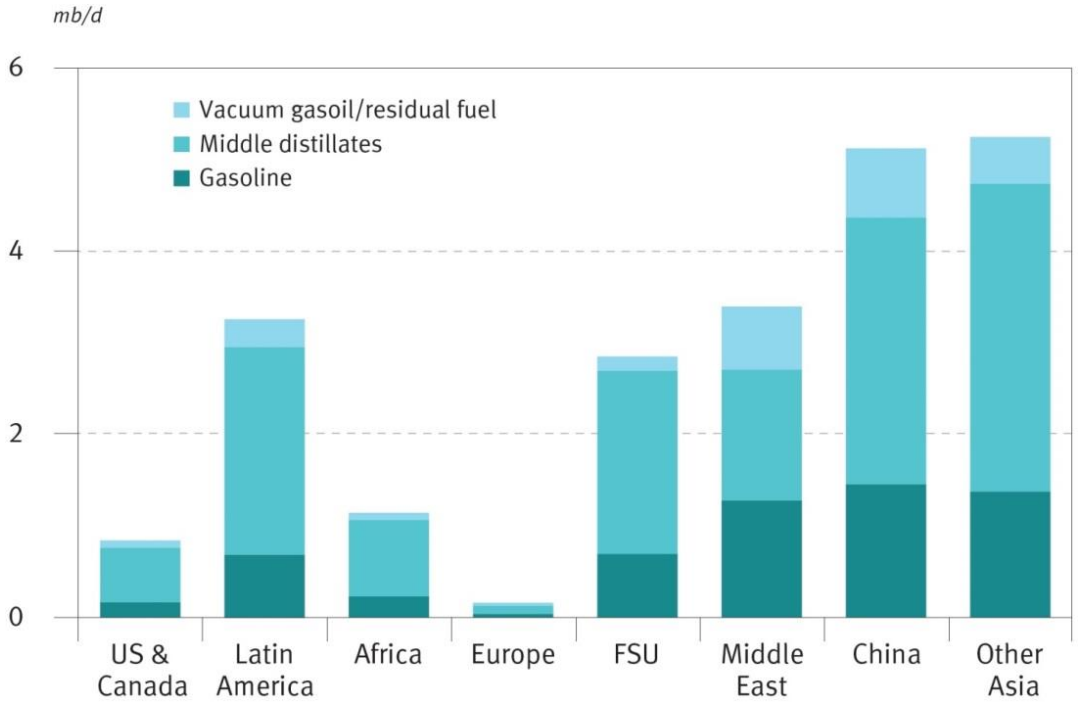


Figure 40 *Desulphurization capacity requirements by product and region, 2011-2035 (OPEC, 2012)*

15. Effect of organosulfur compounds on natural gas properties

Natural gases always have water associated with them, as they are saturated with water in the reservoir. When the hydrocarbons are extracted from underground water is also produced straight from the reservoir. Generally, the water contents of sour gases are defined as a molar average of the solubility of water in the hydrocarbons, hydrogen sulfide, and carbon dioxide (Robinson et al.,1977). The accurate prediction of equilibrium water contents of natural gases is extremely important, especially for sour gases.

Distinct knowledge of phase behavior in water – sour gas systems is essential when it comes to design and operation of production and refining facilities, as well as natural gas pipelines, as considerable amount of gases contain acid gases and water. By preventing the formation of condensed water the risk of related problems can be reduced (Mohammadi et al., 2005).

The first problem related with water content of sour gases is corrosion. The lifetime of natural gas pipelines is affected by the rate at which corrosion occurs. The second problem is the formation of hydrates due to the presence of water in natural gas. Hydrates formation leads to safety hazards to production/transportation/injection systems and to considerable economic risks. The last, but not the least problem is two-phase flow in pipelines (Bahadori, 2011).

The risk of the occurrence of the problems mentioned above can be increased if the gas contains even small amount of hydrogen sulfide or carbon dioxide. That is mainly because the solubility of water in H_2S and in CO_2 differs significantly from the solubility of water in hydrocarbon systems as shown on Figure 41 (Carroll, 2002). This fact can possibly be explained by the discrepancy of molecular structures of these compounds. For instance, hydrogen sulfide has higher polarity than hydrocarbon components found in natural gas because of the asymmetric arrangement of its atoms. Water is strongly polar material itself, as a hence, water will have higher solubility in materials with higher polarity (Lukacs & Robinson, 1963).

The mutual solubility of hydrogen sulfide and carbon dioxide differs substantially with system temperature and pressure. Thus, the presence of sour gas, such as H_2S, and the

presence of acid gas, such as CO_2, in a natural gas mixture would result in a raise in the water content at any given temperature and pressure (Mohammadi, Samieyan, & Tohidi, 2005).

15.1 Pure components behavior

From the previous chapters it is known that the natural gas is a complex mixture. Each component of the natural gas represents unique characteristics which essentially influences on gas behavior. The graphical presentation of this theory is shown in Figure 41, which demonstrates how the water content of pure components of methane, carbon dioxide, and hydrogen sulfide changes with increasing pressure at 120ºF. It is undoubtedly that all three substances show the diversity of behavior that occurs.

It can be seen that at low pressures the water content does not differ considerably for all three components. Generally, at this low pressure the water content is a function of temperature and pressure. However, with increasing pressure the phase behavior for the three components starts to be different.

The water content of methane, which can be considered as sweet gas, steadily decreases as the pressure increases. When it comes to carbon dioxide, the water content declines until the pressure reaches 1000 psia, after that there is an opposite tendency and the water content increases again. Lastly, hydrogen sulfide liquefies. Because of this unique behavior the water content exhibits discontinuity. It should be noted that at lower temperatures CO_2 behaves similarly and liquefies too.

It is reasonable to assume that the characteristics of three pure components would be matched with the behavior of gas mixtures (Carroll, 2002). Sour gases which contain a little volume of CO_2 and H_2S will have the phase behavior in a similar manner to pure methane. The water content of these gas mixtures will be continually declining as a function of pressure. Acid gas mixtures will behave like pure CO_2, but they will not form a second liquid. Sour mixtures with high content of H_2S will behave almost like pure H_2S. These gases under certain value of pressure and temperature will be in a liquid phase (Carroll, 2002).

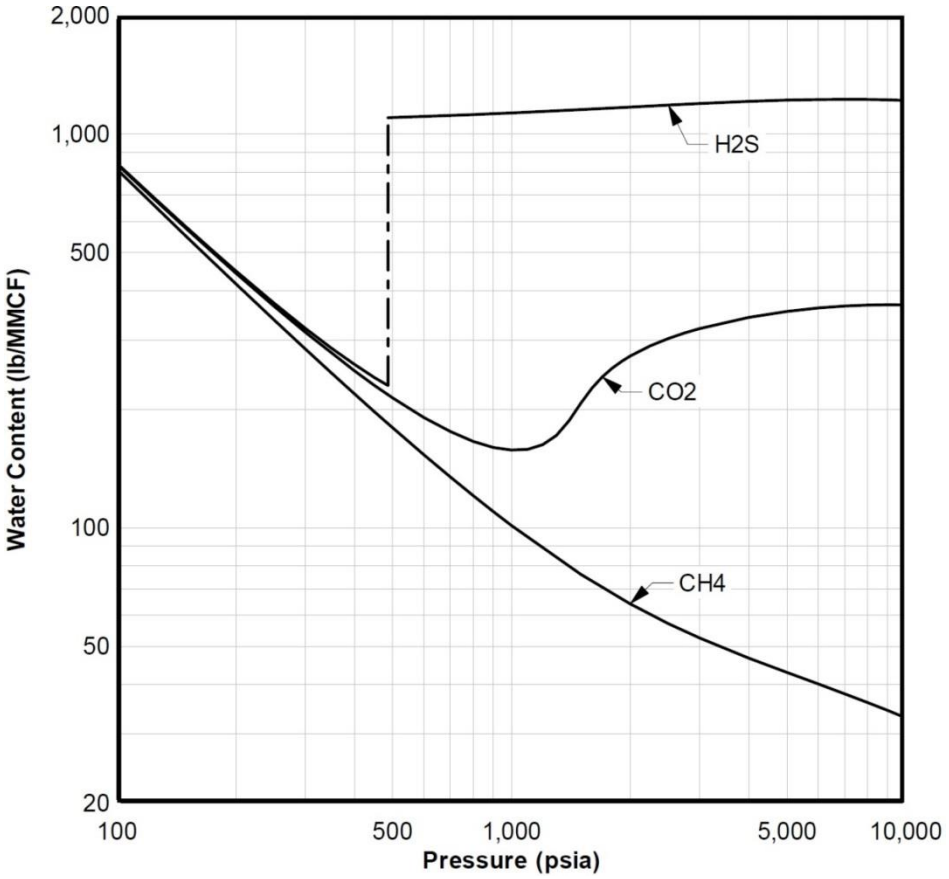


Figure 41 *Water content of three gases at 120ºF (50°C) (Carroll, 2002)*

15.2 Estimation of water content in sour gases

It is believed that sour/acid gases deteriorate the quality of natural gas by affecting the water content of those natural gases. In this subsection the water content of several gases with simplified content and existing gas fields is calculated using the AQUALIBRIUM software, version 3.01. There is a description of this software on the official website of FlowPhase®. There it says that AQUALIBRIUM is a software package for systems containing water, hydrogen sulfide, carbon dioxide, and light hydrocarbons. It has a well-deserved reputation for being amongst the most accurate software for equilibrium calculations in these systems, especially for acid gas + water systems.

First, the water content of natural gases with simplified composition was calculated. Only methane and hydrogen sulfide were taken into consideration to study the general behavior of those gases under three different conditions, reservoir, wellhead, and end-pipe conditions. The values of those parameters are generally accepted in natural gas

production operations; moreover, it should be noted that there are other reservoir and surface pressure/temperature conditions.

Figure 42 presents the water content lines versus increasing hydrogen sulfide content of several gases. It is obvious that with increasing content of H_2S the water content also increases significantly. For instance, the gas with high sour content 75% H_2S carries 72% more water vapor as compared to sweeter gas with 15% H_2S.

The result also shows that the water depending on conditions starts to condense out of the gas. Under reservoir conditions the gas holds the largest amount of water, while under end-pipe conditions the water is decreased to a minimum level.

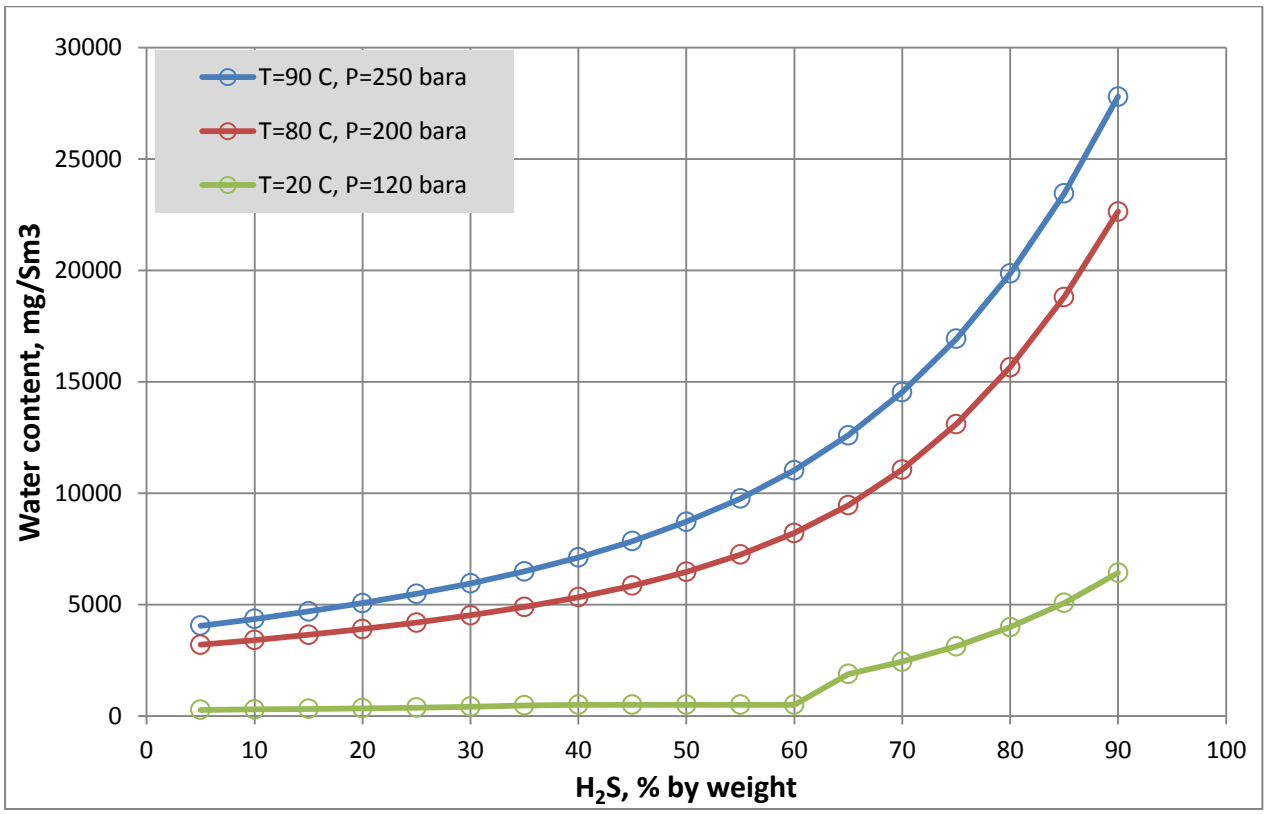


Figure 42 *Water content versus H_2S content of natural gases with simplified composition*

Table 17 *Water content of selected natural gases calculated with AQUALIBRIUM*

Conditions	Pressure, bara	Temperature, ºC	Water content, mg/Sm^3			
			Lacq	Kirkuk	Parentis	Kashagan
Reservoir	250	90	5196	4099	3612	5104
Wellhead	200	80	4004	3224	2867	3954
End pipe	120	20	359	282	240	372

Table 18 Composition of selected natural gases

Component	Lacq (France)	Kirkuk (Iraq)	Parentis (France)	Kashagan (Kazakhstan)
Methane	69.0	56.9	73.6	58.77
Ethane	3.0	21.2	10.2	9.01
Propane	0.9	6.0	7.6	4.54
Butanes	0.5	3.7	5.0	2.29
C_{5+}	0.1	1.6	3.6	1.49
Nitrogen	1.5	-	-	1.01
H2S	15.3	3.5	-	17.81
CO2	9.3	7.1	-	5.08

Table 17 gives the results on water content calculation for the gases from different parts of the world. The composition of the natural gases under studies is given in Table 18. It can be seen that sour gases from Lacq and Kashagan field exhibits undesirable behavior. The high sourness of these gases explains the higher values of water content in comparing with other sweeter gases from Kirkuk and Parentis fields. When it comes to pressure and temperature conditions, there is a common tendency for all four gases. The water vapor starts to condense out of the gas solution, and the water vapor values condensed at the wellhead equal to 1192 mg/Sm^3 and 1150 mg/Sm^3 for Lacq and Kashagan fields respectively, and at the end-pipe the values are 3645 mg/Sm^3 and 3582 mg/Sm^3 which is more or less the same.

It is of vital importance to know the amount of difference between the water content at reservoir conditions and the water condensed at the receiving terminal, as by knowing it the dehydration facilities can be designed and the formation of hydrates can be removed.

Table 19 *Water content of gases with simplified composition calculated by AQUALIBRIUM*

H_2S, weight %	$CH_{1,}$ weight %	Water content, mg/Sm^3	Water content, mg/Sm^3	Water content, mg/Sm^3
90	10	27796	22638	6421
85	15	23446	18802	5073
80	20	19860	15652	3990
75	25	16923	13096	3123
70	30	14533	11057	2431
65	35	12597	9456	1881
60	40	11030	8211	505
55	45	9757	7239	505
50	50	8712	6468	505
45	55	7844	5844	505
40	60	7113	5328	505
35	65	6489	4892	471
30	70	5950	4517	417
25	75	5478	4190	375
20	80	5061	3900	342
15	85	4690	3640	315
10	90	4355	3406	291
5	95	4052	3193	271

Summary

New petroleum product specifications have had profound impact on refineries' business philosophy worldwide. Petroleum companies are investing vast amount of money to introduce breakthrough technologies and to upgrade existing ones.

After in-depth analysis of existing commercial and semi-commercial desulphurization technologies it can be concluded that those technologies cannot satisfy the industry requirements and cannot be complied with the market needs. Conventional hydrodesulphurization is very expensive (desulphurization of 20,000 barrel of oil is as much as $40 million) and energy intensive sulfur removal technique. HDS operates at elevated temperatures (290 to 445˚C) and pressures (35 to 170 atm.), uses very costly hydrogen, removes only easy sulfur (hydrogen sulfide, thiols, etc.), and reduces the quality of refined products. As a hence, decreased energy is returned on energy invested and the impact on the environment is increased. Time and money being spent on research and development for the hydrodesulphurization could be better invested into developing alternative technologies.

It is known that organosulfur removal operations are implemented at surface conditions. But is it the only way to desulfurize hydrocarbon feeds? One of the revolutionary ideas is to develop in-situ or downhole sulfur capture technologies (*DoSCap* technology {Darkhan Duissenov}). Crude oil and natural gas with high sulfur content could be upgraded in the source rock and desulfurized before hydrocarbons are transported to surface. By implementing the *DoSCap* technology additional CAPEX and OPEX would be reduced considerably. The costs of lost time, the replacement of materials of construction, and the constant personnel involvement caused by corrosion, would be avoided. Finally, the commercial value of crude oil would be increased by about 10-15%.

However, the scientists involved in research of the problem under consideration are focused on more immediate challenges and working with currently available techniques and tools. One of the alternatives could be the integration of biodesulphurization process units into existing refineries. There are two options, first option is to put BDS before conventional HDS, and second option is to implement BDS after conventional HDS. In order to do so significant modification of current operations is needed. Biocatalytic desulphurization involves certain type of bacterial strain in order to selectively remove

sulfur compounds with high-boiling temperature (thiophenes, dibenzothiophenes, and their alkyl derivatives).

Another alternative is the implementation of combined technologies. In combined technologies the processes could be based on existing sulfur removal techniques, such as oxidative desulphurization, biocatalytic desulphurization, and hydrogenation processes. Furthermore, base technologies could be complemented by various physical forces and chemical reactions. Microwave energy, catalysis and hydrotreatment together can improve the effect of desulphurization and some results were already gained. Also the combination of ultrasonic/microwave and electrostatic fields with oxidative desulphurization will lead to improved process parameters and higher desulphurization rates (Lin et al., 2010).

What is clear for now is that the alternative technologies mentioned above certainly have barriers for commercialization, and most of them have been met with certain opposition within the petroleum industry. The situation threatens to become more challenging with increasing sulfur content trend. While novel technologies are being developed to remove the organosulfur compounds, there is little doubt that utilization of the sour resources will have a negative impact.

Conclusion

- The authorities and environmental agencies are trending down the level of sulfur in petroleum products worldwide. The main purpose of those regulations is to yield high quality fuels with sulfur content less than 10 ppm. It is expected that by 2025 the maximum allowable level of sulfur for gasoline(10 ppm in US & EU, 20 ppm in FSU, 25 ppm in the Middle East) and for diesel (10 ppm in US & EU, 15 ppm in FSU, 40 ppm in Latin America) will be reduced tremendously.
- Conventional HDS is a very, very expensive process which uses elevated pressures and elevated temperatures; moreover HDS is not highly efficient and consumes outrageous amount of energy, resulting in decreased energy returned on energy invested and the increased impact on the environment;
- Biocatalytic biodesulphurization is an effective tool in removal of heavy sulfur compounds as dibenzothiophenes and their alkyl derivatives. Biocatalyst converts dibenzothiophene into 2-hydroxybiphenyl and sulfate via 4S pathway without any change of fuel heating value.
- New integrated technologies such as BDS-OD-RA (desulphurization rate 85-95% for crude oil in anaerobic conditions, 94-95% in aerobic conditions), combined hydrogenation-biodesulphurization technologies (bacterial strains *Rhodococcus erythropolis, Arthrobacter paraffineus, Bacillus sphaericus, Rhodococcus rhodochrous*), desulphurization processes involving ultrasonic-catalytic oxidation (simple operation, low cost, low temperature, high efficiency) could be an excellent alternatives to conventional desulphurization technologies.
- Distinct knowledge of phase behavior in water – sour gas systems is essential when it comes to design and operation of production and refining facilities, as well as natural gas pipelines, as considerable amount of gases contain sour gases and water. By preventing the formation of condensed water the risk of related problems can be reduced.

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Appendices

Table 20 *Estimated proved reserves holders as of January 2013 (Rachovich, 2012)*

Rank	Country	Proved reserves (billion barrels)	Share of total
1.	Venezuela	297.6	18.2%
2.	Saudi Arabia	265.4	16.2%
3.	Canada	173.1	10.6%
4.	Iran	154.6	9.4%
5.	Iraq	141.4	8.6%
6.	Kuwait	101.5	6.2%
7.	UAE	97.8	6.0%
8.	Russia	80.0	5.0%
9.	Libya	48.0	2.9%
10.	Nigeria	37.2	2.3%
11.	Kazakhstan	30.0	1.8%
12.	China	25.6	1.6%
13.	Qatar	25.4	1.6%
14.	United States	20.7	1.3%
15.	Brazil	13.2	0.8%
16.	Algeria	12.2	0.7%
17.	Angola	10.5	0.6%
18.	Mexico	10.3	0.6%
19.	Ecuador	8.2	0.5%
20.	Azerbaijan	7.0	0.4%
21.	Oman	5.5	0.3%
22.	India	5.48	0.3%
23.	Norway	5.37	0.3%
World total		1,637.9	100
Total OPEC		1,204.7	73.6

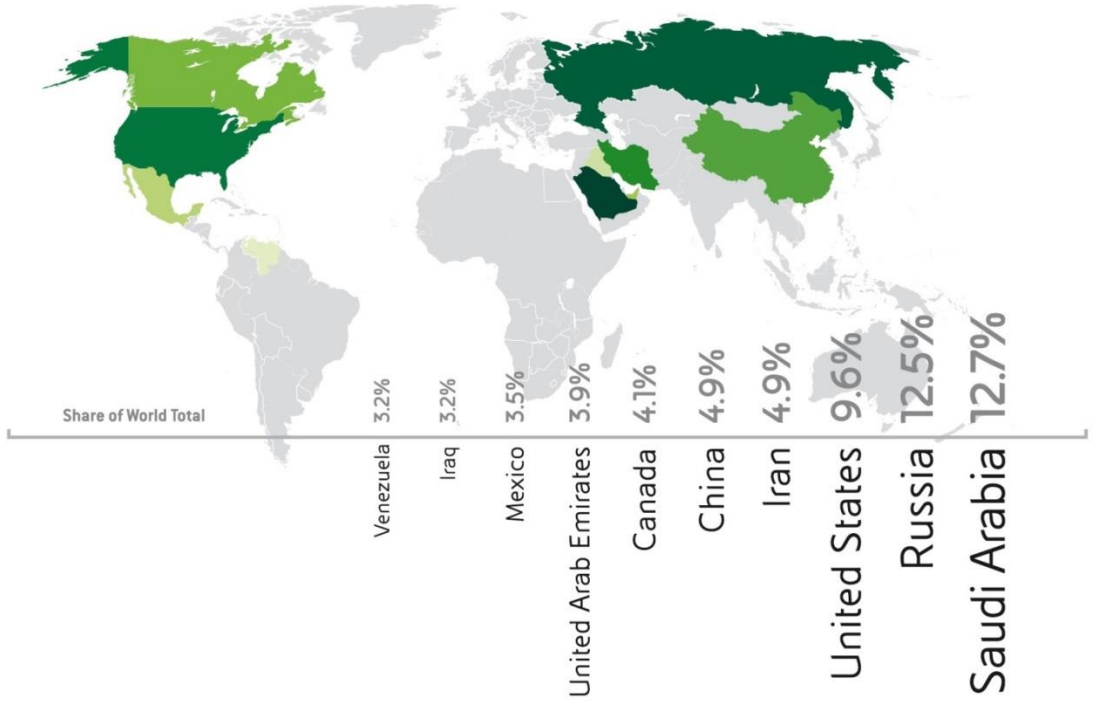


Figure 43 *The world top 10 oil producers (Eni, 2012)*

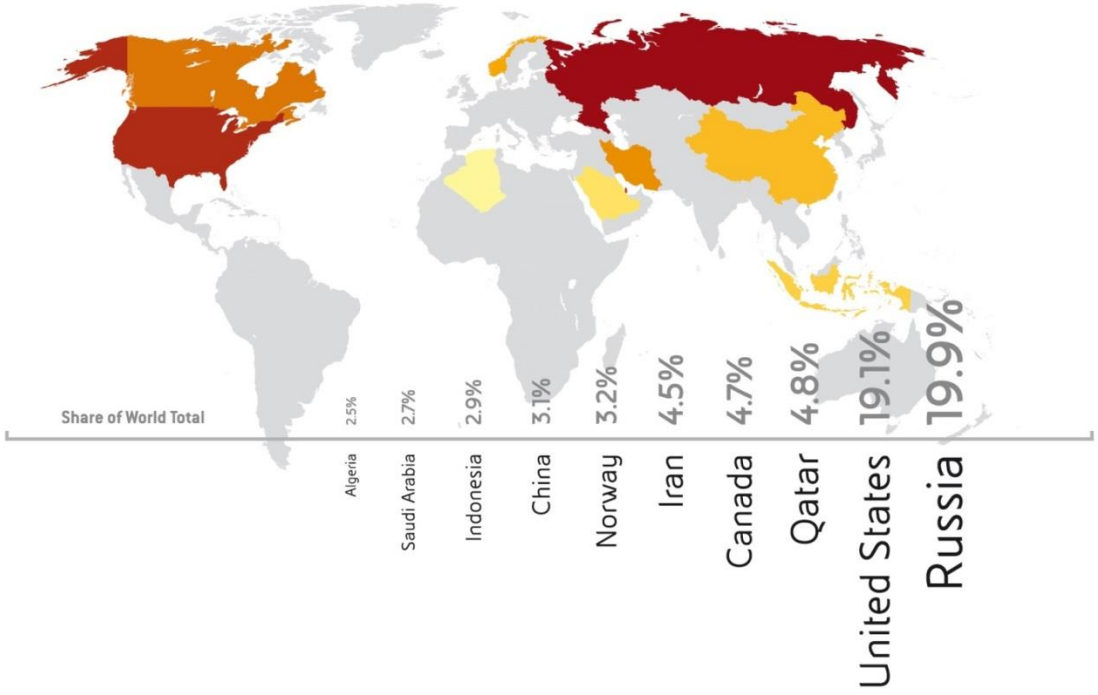


Figure 44 *The world top 10 natural gas producers (Eni, 2012)*

Table 21 *Crude production by gravity (thousand barrels/day) (Eni, 2012)*

	1995	2000	2005	2008	2009	2010	2011
World	**62,759**	**68,008**	**73,862**	**74,673**	**73,062**	**74,091**	**74,700**
Light	17,624	19,341	19,203	19,345	18,409	19,254	18,385
Medium	32,566	34,805	39,445	40,445	39,273	38,731	39,789
Heavy	6,440	8,052	9,922	9,698	9,768	10,370	10,508
Unassigned production	6,130	5,811	5,292	5,185	5,613	5,736	6,018
(percentage)							
Light	28.1	28.4	26.0	25.9	25.2	26.0	24.6
Medium	51.9	51.2	53.4	54.2	53.8	52.3	53.3
Heavy	10.3	11.8	13.4	13.0	13.4	14.0	14.1
Unassigned production	9.8	8.5	7.2	6.9	7.7	7.7	8.1

Table 22 *Crude production by sulfur content (thousand barrels/day) (Eni, 2012)*

	1995	2000	2005	2008	2009	2010	2011
World	**62,759**	**68,008**	**73,862**	**74,673**	**73,062**	**74,091**	**74,700**
Sweet	20,395	22,334	23,325	23,252	22,892	23,637	22,539
Medium Sour	4,946	6,042	6,593	8,225	8,477	8,681	8,757
Sour	31,288	33,821	38,653	38,010	36,080	36,036	37,386
Unassigned production	6,130	5,811	5,292	5,185	5,613	5,736	6,018
(percentage)							
Sweet	32.5	32.8	31.6	31.1	31.3	31.9	30.2
Medium Sour	7.9	8.9	8.9	11.0	11.6	11.7	11.7
Sour	49.9	49.7	52.3	50.9	49.4	48.6	50.0
Unassigned production	9.8	8.5	7.2	6.9	7.7	7.7	8.1

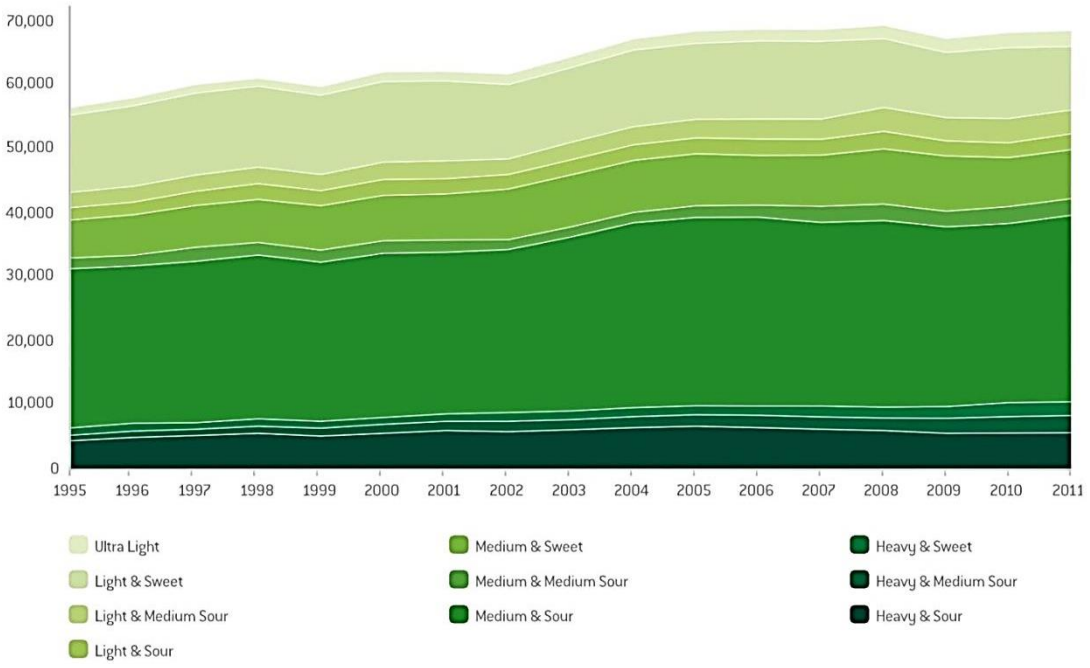


Figure 45 *Worldwide crude production by quality (thousand barrels/day) (Eni, 2012)*

Table 23 *Main features of some qualities of crude oil (benchmarks in* ***bold****) (Maugeri, 2006)*

Name	Origin	Daily production (thousand barrels)	API degree	Sulfur content (%)
Brent blend	**United Kingdom**	**300**	**38.7**	**0.31**
Forties	United Kingdom	650	37.3	0.40
Ekofisk	Norway	500	37.8	0.22
Statfjord	Norway	480	37.7	0.29
WTI Blend	**United States**	**300**	**38.7**	**0.45**
Alaskan	United States	950	31	1
North Slope				
Light Louisiana	United States	400	38.7	0.13
West Texas Sour	United States	775	34.2	1.30
BCF-17	Venezuela	800	16.5	2.5
Maya	Mexico	2,450	21.6	3.6
Isthmus	Mexico	500	32.8	1.4
Olmeca	Mexico	400	39.3	0.8
Urals	Russia	3,200	32	1.30
Siberian Light	Russia	100	35.6	0.46
Arabian Light	**Saudi Arabia**	**5,000**	**33.4**	**1.80**
Arabian	Saudi Arabia	1,200	37	1.33
Extra Light				
Arabian Medium	Saudi Arabia	1,500	30.3	2.45
Arabian Heavy	Saudi Arabia	800	28.7	2.8
Basrah Light	Iraq	1,600	30.2	2.6
Kirkuk	Iraq	350	33.3	2.3
Iran Heavy	Iran	1,700	30	2
Iran Light	Iran	1,300	33.4	1.6
Kuwait	Kuwait	2,000	31	2.63
Dubai	**Dubai**	**100**	**31.4**	**2**
Bonny Light	**Nigeria**	**450**	**34.3**	**0.15**
Forcados	Nigeria	400	30.4	0.18
Escavros	Nigeria	300	34.4	0.15
Cabina	Angola	300	32	0.12
Palanca	Angola	200	37	0.17
Brega	Libya	120	42	0.20
Bu Attifel	Libya	100	43	0.03
Es Sider	Libya	300	36.6	0.42
Saharan Blend	Algeria	350	47	0.11
Tapis	**Malaysia**	**300**	**45.2**	**0.03**
Daquing	China	1,000	32.2	0.09
Shengli	China	550	26	0.76

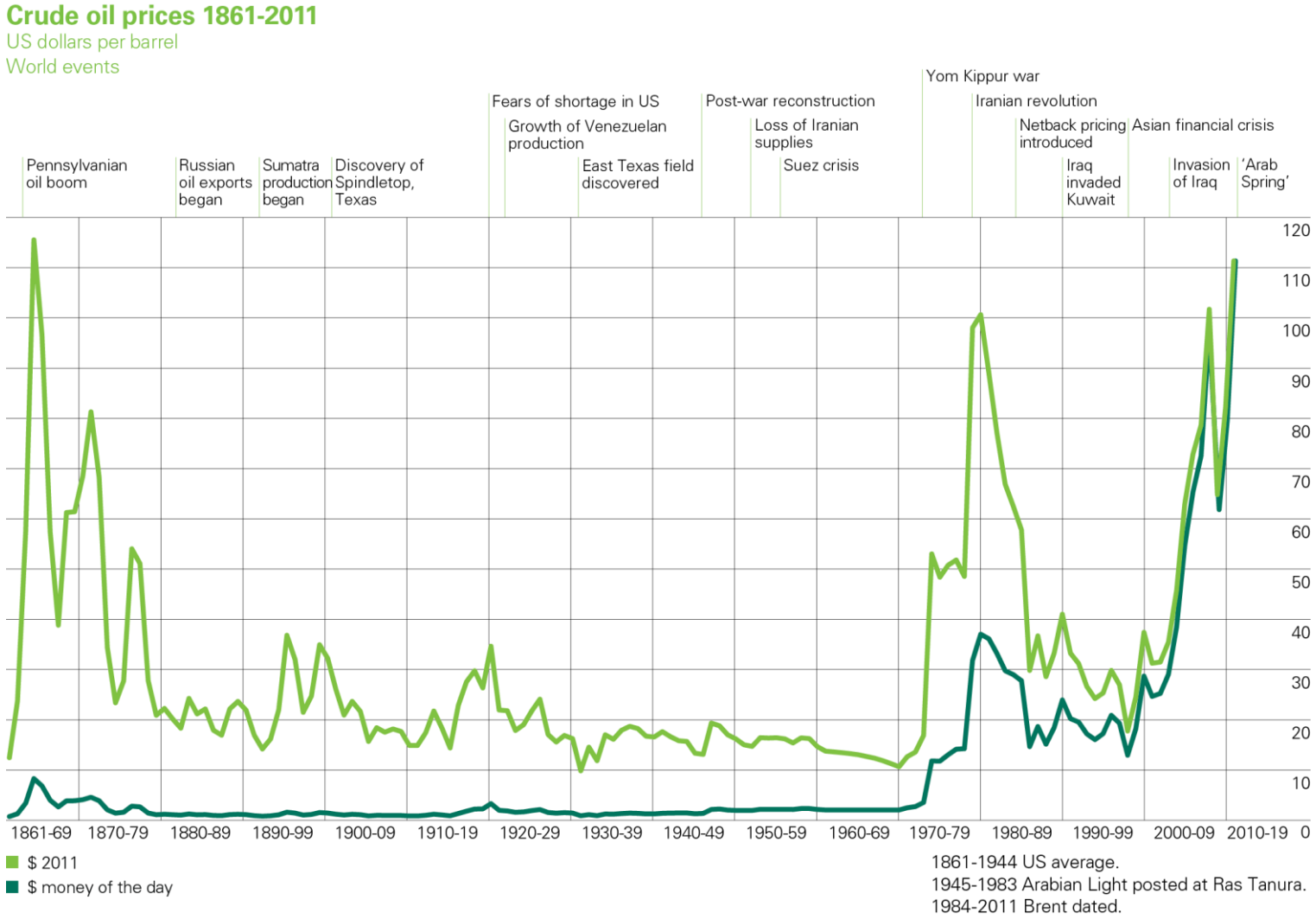


Figure 46 *Historical crude oil prices, 1861-2011 (BP, 2012)*

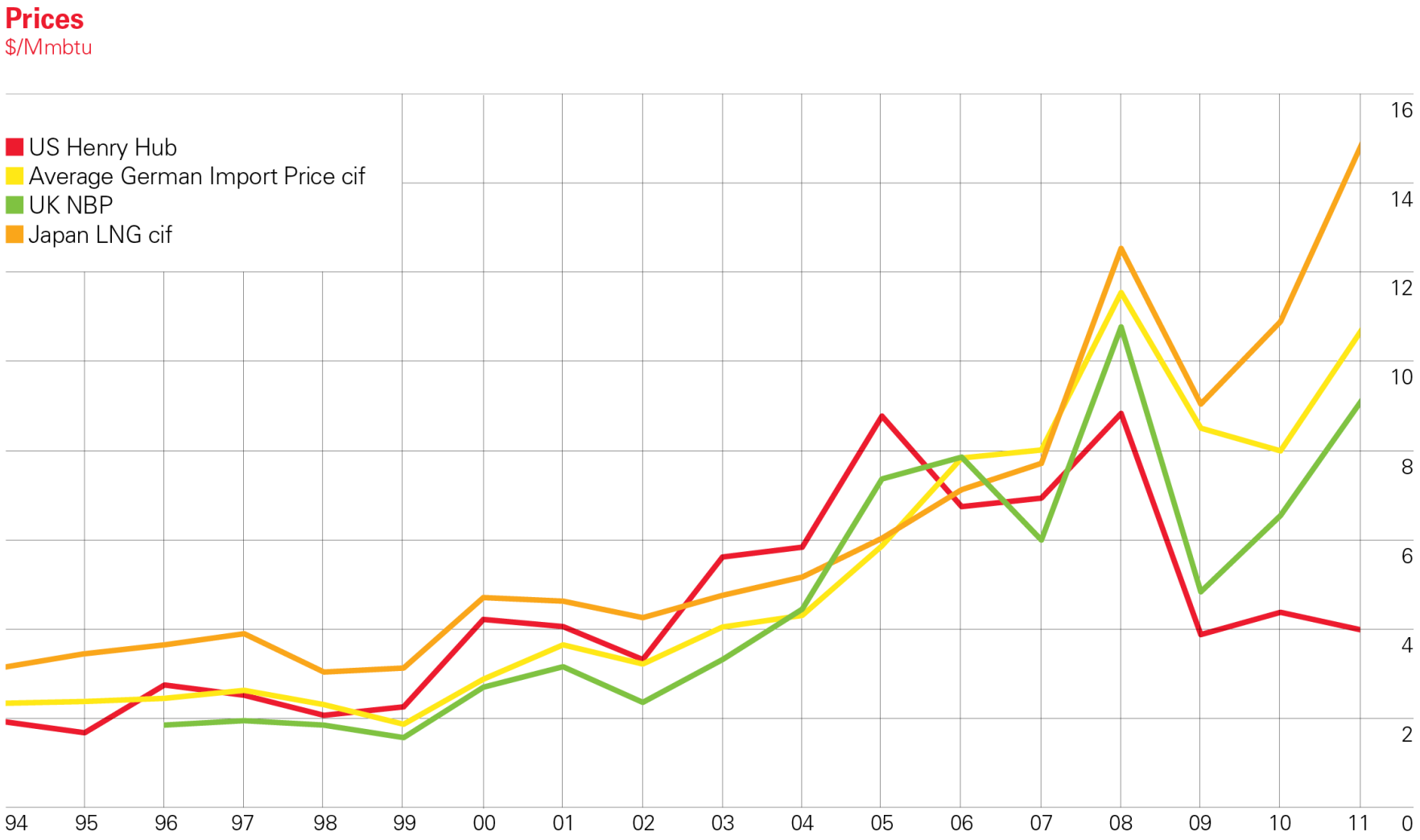


Figure 47 *Historical natural gas prices, 1994-2011 (BP, 2012)*

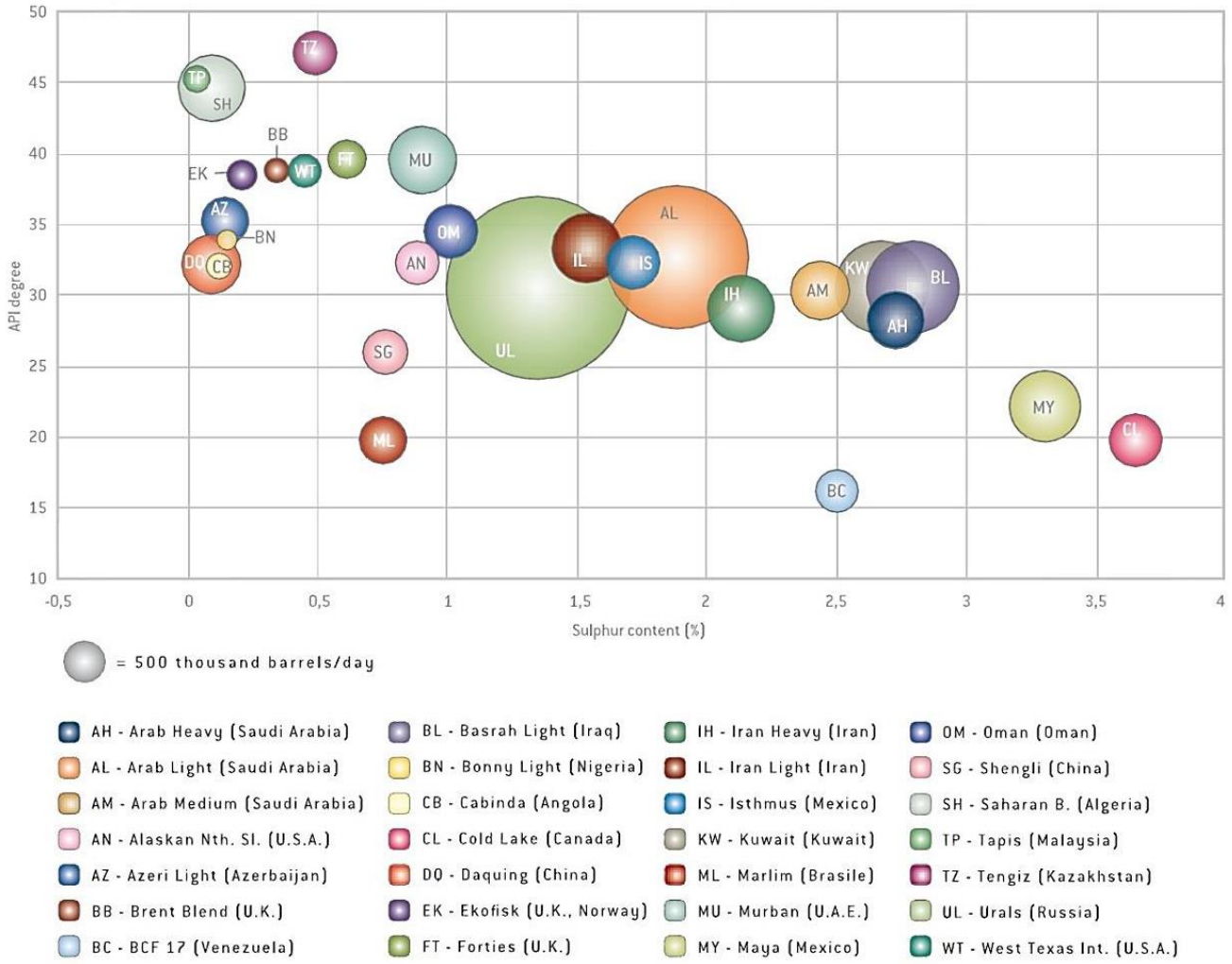


Figure 48 *Quality and production volume of main crudes (thousand barrels/day) (Eni, 2011)*

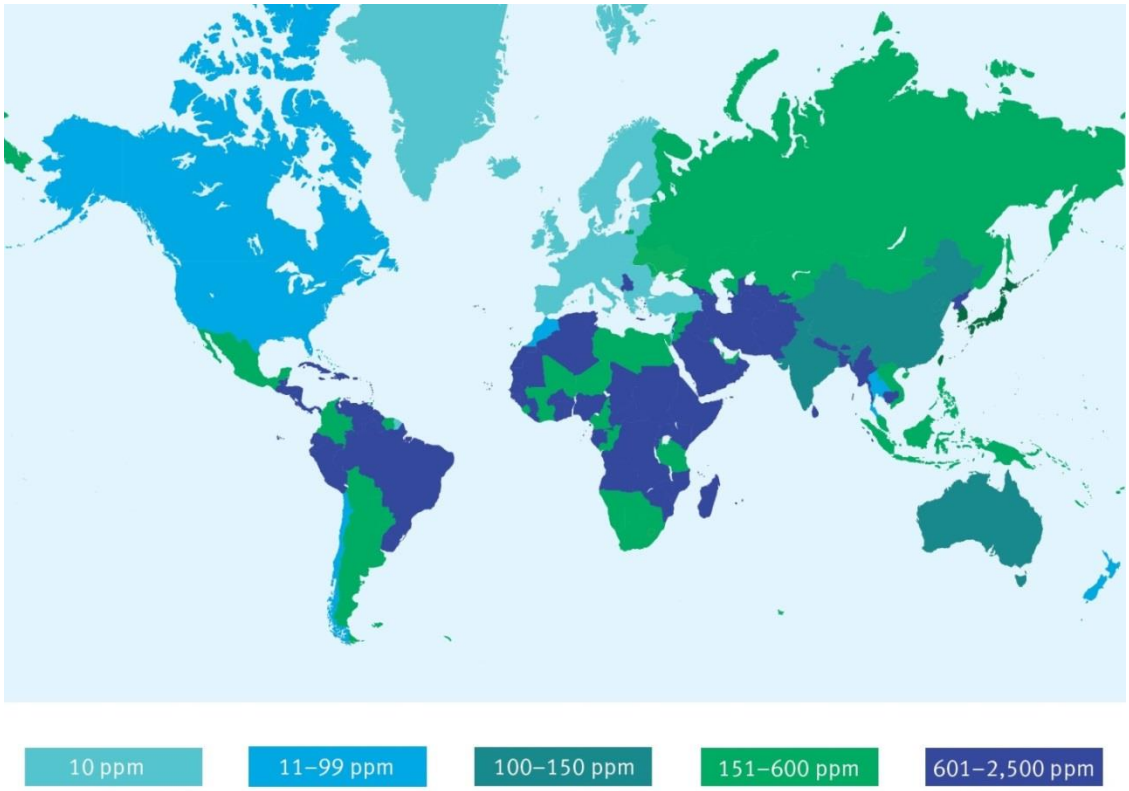


Figure 49 *Maximum gasoline sulfur limits as of September 2012 (OPEC, 2012)*

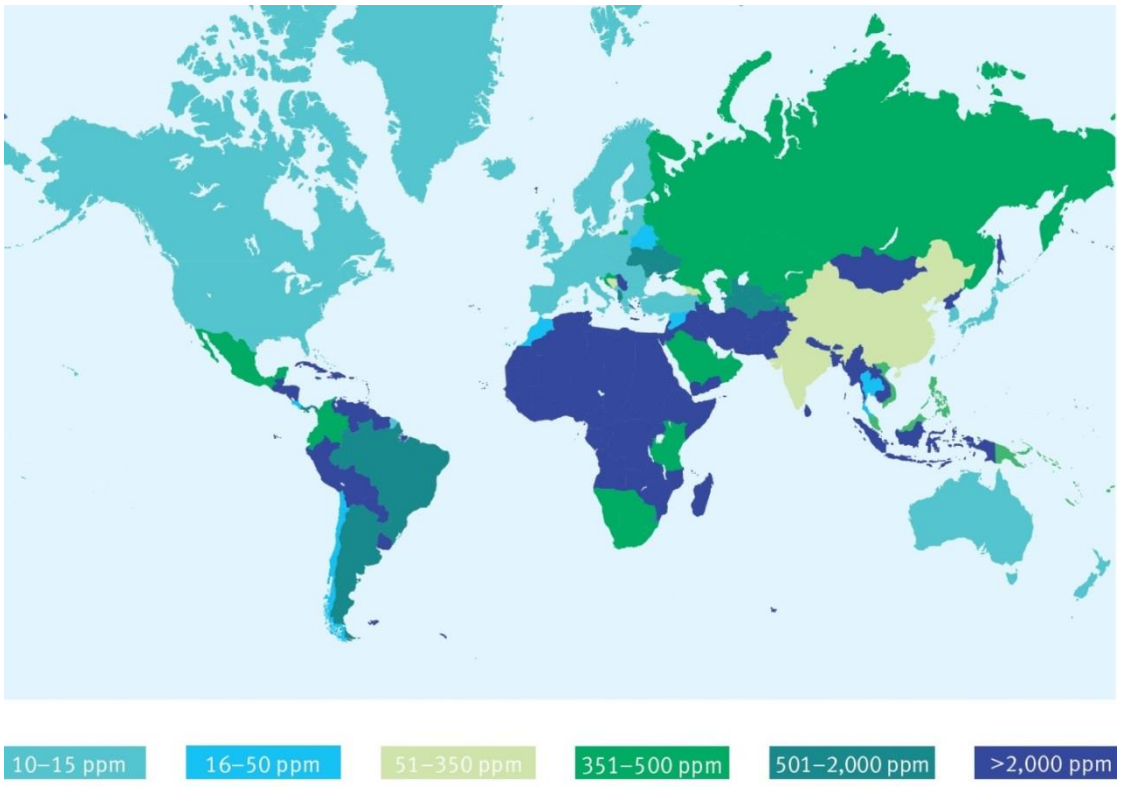


Figure 50 *Maximum on-road diesel sulfur limits as of September 2012 (OPEC, 2012)*

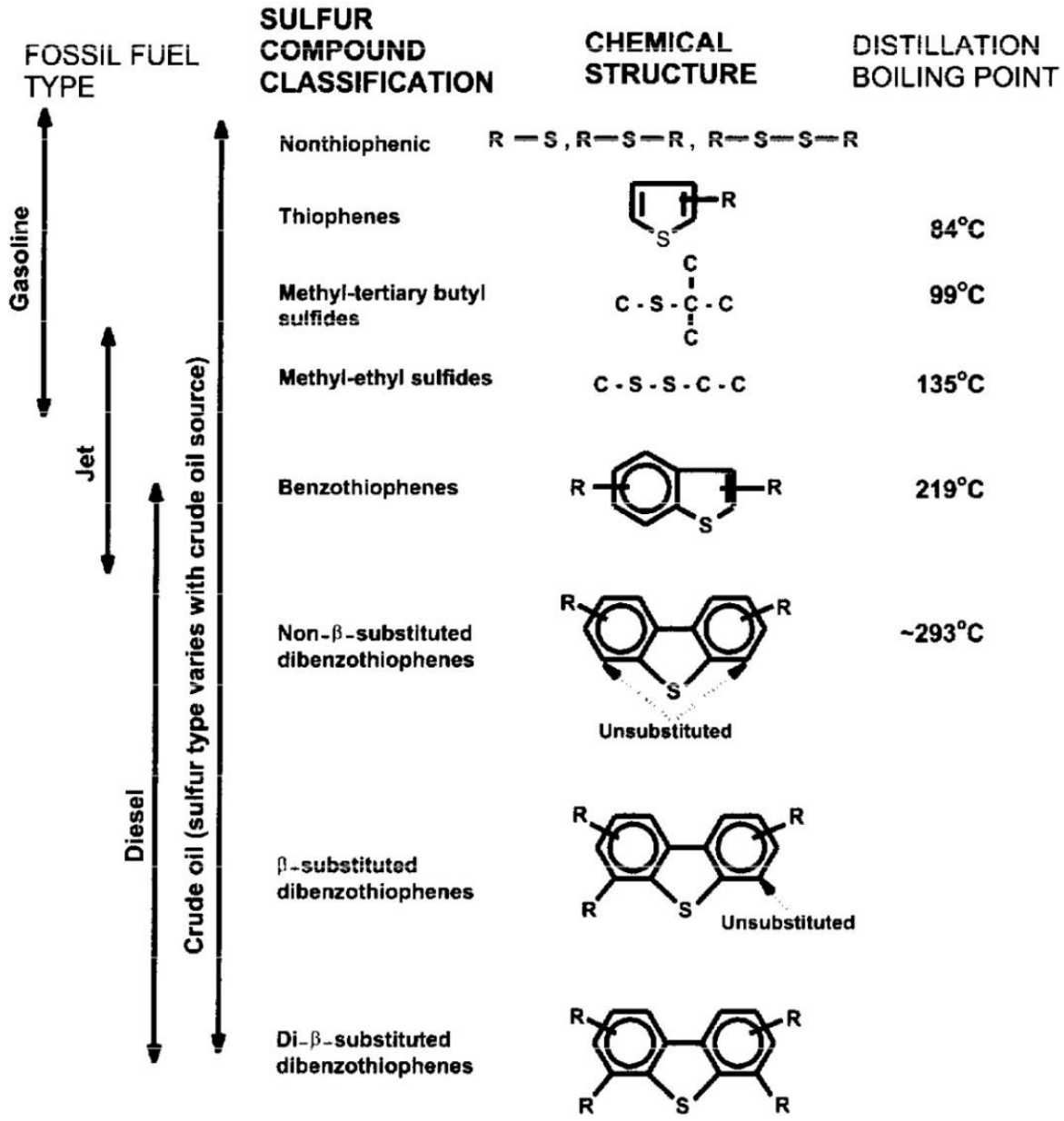


Figure 51 *Examples of organosulfur compounds present in fossil fuels (McFarland, 1999)*

Table 24 *Effect of hydrotreatment on the characteristics of gas oil (Wauquier, 1995)*

Product designation	A	A+	A++	A+++	A++++
Density, kg/l at 15˚C	0.862	0.850	0.849	0.838	0.827
Viscosity at 20˚C, mm^2/s	5.55	5.34	5.22	5.12	4.90
Sulfur content, ppm	11,600	640	230	22	4
Nitrogen content, ppm	216	150	135	17	0.2
Cetane number	49.0	50.4	49.0	53.9	60.2
Composition, weight %					
Paraffins	36.5	36.2	36.8	37.0	41.4
Naphthenes	24.3	24.5	36.5	37.7	51.8
Monoaromatics	14.2	23.1	21.9	20.2	6.0
Diaromatics	15.4	12.8	12.6	4.5	0.8
Triaromatics	1.8	1.0	0.9	0.4	0.0
Thiophenes	7.7	2.4	1.4	0.3	0.0
Total aromatics	39.1	39.3	36.8	25.4	6.8

Table 25 *Overview of petroleum refining processes (OSHA, 1999)*

Process name	Action	Method	Purpose	Feedstock	Product
Fractional processes					
Atmospheric distillation	Separation	Thermal	Separate fractions	Desalted crude oil	Gas, gas oil, distillate, residual
Vacuum distillation	Separation	Thermal	Separate w/o cracking	Atmospheric tower residua	Gas oil, lube stock, residual
Conversion processed-decomposition					
Catalytic cracking	Alteration	Catalytic	Upgrade gasoline	Gas oil, coke distillate	Gasoline, petrochemical feedstock
Coking	Polymerize	Thermal	Convert vacuum residuals	Gas oil, coke distillate	Gasoline, petrochemical feedstock
Hydro-cracking	Hydrogenate	Catalytic	Convert to lighter HC's	Gas oil, cracked oil, residual	Lighter, higher-quality products
Visbreaking	Decompose	Thermal	Reduce viscosity	Atmospheric tower residual	Distillate, tar
Conversion processes-unification					
Alkylation	Combining	Catalytic	Unite olefins & isoparaffins	Tower isobutane/ cracker olefin	Iso-octane (alkylate)
Grease compounding	Combining	Thermal	Combine soaps & oils	Lube oil, fatty acid, alky metal	Lubricating grease
Polymerizing	Polymerize	Catalytic	Unite 2 or more olefins	Cracker olefins	High-octane naphtha, petrochemical stocks
Conversion processes-alteration or rearrangement					
Catalytic reforming	Alteration/ dehydration	Catalytic	Upgrade low-octane naphtha	Coker/ hydro-cracker naphtha	High octane reformate/ aromatic

Isomerization	Rearrange	Catalytic	Convert straight chain to branch	Butane, pentane, hexane	Isobutane/ pentane/ hexane
Treatment processes					
Amine treating	Treatment	Absorption	Remove acidic contaminants	Sour gas, HCs w/CO_2 & H_2S	Acid free gases & liquid HCs
Desalting	Dehydration	Absorption	Remove contaminants	Crude oil	Desalted crude oil
Drying & sweetening	Treatment	Absorption /thermal	Remove H_2O & sulfur compounds	Liquid HCs, LPG, alkyl feedstock	Sweet & dry hydrocarbons
Furfural extraction	Solvent extraction	Absorption	Upgrade mid distillate & lubes	Cycle oils & lube feed-stocks	High quality diesel & lube oil
Hydrodesulphurization	Treatment	Catalytic	Remove sulfur, contaminants	High-sulfur residual/ gas oil	Desulfurized olefins
Hydrotreating	Hydrogenation	Catalytic	Remove impurities, saturate HC's	Residuals, cracked HC's	Cracker feed, distillate, lube
Phenol extraction	Solvent extraction	Absorption /thermal	Improve viscosity index, color	Lube oil base stocks	High quality lube oils
Solvent deasphalting	Treatment	Absorption	Remove asphalt	Vacuum tower residual, propane	Heavy lube oil, asphalt
Solvent dewaxing	Treatment	Cool/ filter	Remove wax from lube stocks	Vacuum tower lube oils	Dewaxed lube basestock
Solvent extraction	Solvent extraction	Absorption/ precipitation	Separate unsat. oils	Gas oil, reformate, distillate	High-octane gasoline
Sweetening	Treatment	Catalytic	Remove H_2S, convert mercaptan	Untreated distillate/gasoline	High-quality distillate/gasoline

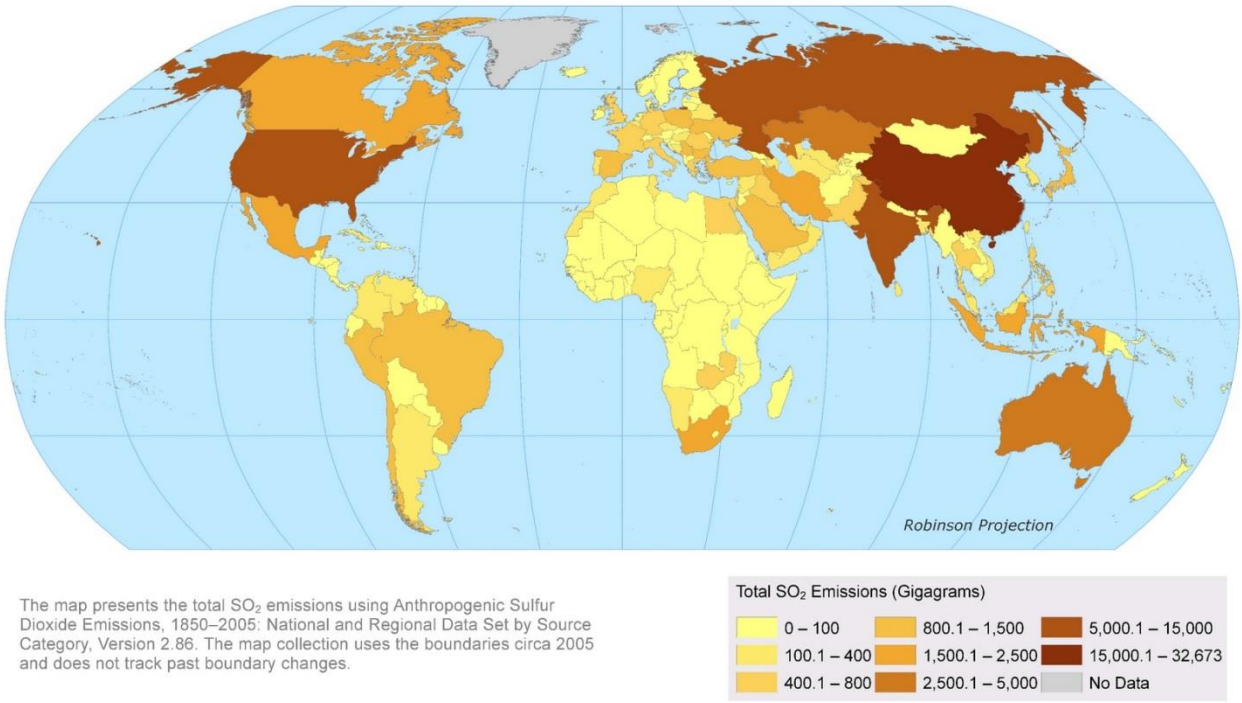


Figure 52 *Worldwide total SO_2 emissions as of 2005 (NASA, 2005)*

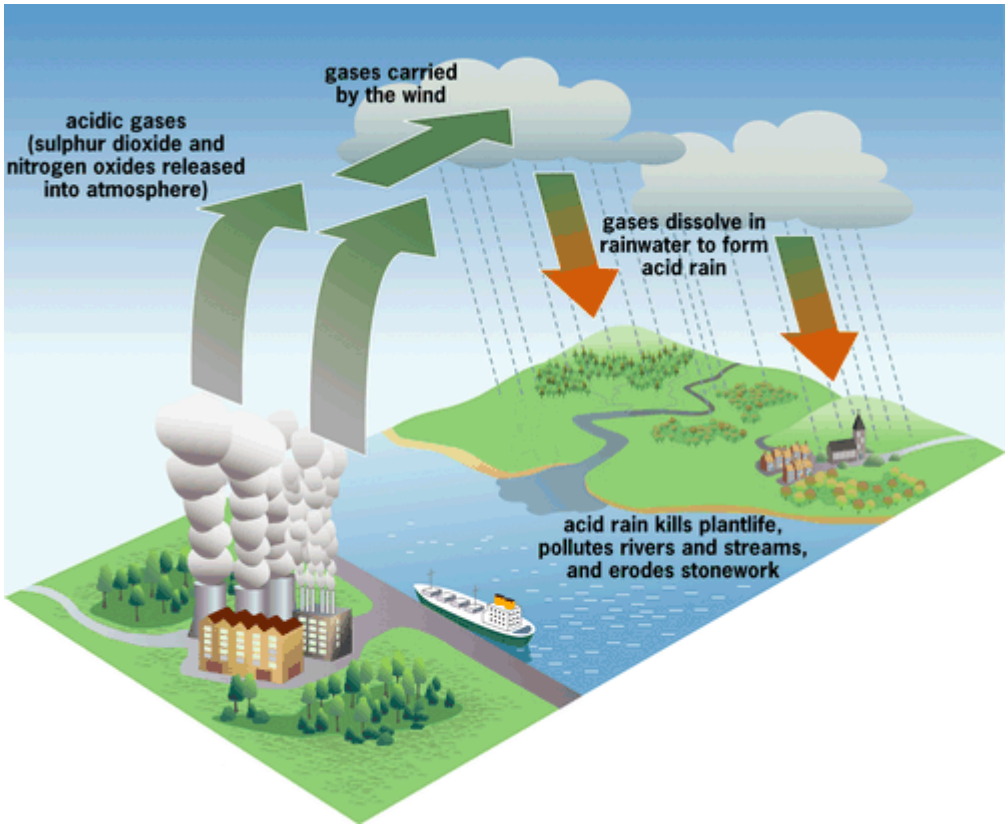


Figure 53 *Acid rain formation (McDonald, 2009)*

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

HYDROGEN SULFIDE

CAS # 7783-06-4

Division of Toxicology and Environmental Medicine ToxFAQs™ **July 2006**

This fact sheet answers the most frequently asked health questions (FAQs) about hydrogen sulfide. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Hydrogen sulfide occurs naturally and is also produced by human activities. Just a few breaths of air containing high levels of hydrogen sulfide gas can cause death. Lower, longer-term exposure can cause eye irritation, headache, and fatigue. Hydrogen sulfide has been found in at least 35 of the 1,689 National Priorities List sites identified by the U.S. Environmental Protection Agency (EPA).

What is hydrogen sulfide?

Hydrogen sulfide (H_2S) occurs naturally in crude petroleum, natural gas, volcanic gases, and hot springs. It can also result from bacterial breakdown of organic matter. It is also produced by human and animal wastes. Bacteria found in your mouth and gastrointestinal tract produce hydrogen sulfide from bacteria decomposing materials that contain vegetable or animal proteins. Hydrogen sulfide can also result from industrial activities, such as food processing, coke ovens, kraft paper mills, tanneries, and petroleum refineries.

Hydrogen sulfide is a flammable, colorless gas with a characteristic odor of rotten eggs. It is commonly known as hydrosulfuric acid, sewer gas, and stink damp. People can smell it at low levels.

What happens to hydrogen sulfide when it enters the environment?

❏ Hydrogen sulfide is released primarily as a gas and spreads in the air.
❏ Hydrogen sulfide remains in the atmosphere for about 18 hours.
❏ When released as a gas, it will change into sulfur dioxide and sulfuric acid.
❏ In some instances, it may be released as a liquid waste from an industrial facility.

How might I be exposed to hydrogen sulfide?

❏ You may be exposed to hydrogen sulfide from breathing contaminated air or drinking contaminated water.
❏ Individuals living near a wastewater treatment plant, a gas and oil drilling operation, a farm with manure storage or livestock confinement facilities, or a landfill may be exposed to higher levels of hydrogen sulfide.
❏ You can be exposed at work if you work in the rayon textiles, petroleum and natural gas drilling and refining, or wastewater treatment industries. Workers on farms with manure storage pits or landfills can be exposed to higher levels of hydrogen sulfide.
❏ A small amount of hydrogen sulfide is produced by bacteria in your mouth and gastrointestinal tract.

How can hydrogen sulfide affect my health?

Exposure to low concentrations of hydrogen sulfide may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Brief exposures to high concentrations of hydrogen sulfide (greater than 500 ppm) can cause a loss of consciousness and possibly death. In most cases, the person appears to regain consciousness without any other effects. However, in many individuals, there may be permanent or long-term effects such as headaches, poor attention span, poor memory, and poor motor function. No health effects have been found in humans exposed to typical environmental concentrations of hydrogen sulfide (0.00011–0.00033 ppm).

Scientists have no reports of people poisoned by ingesting hydrogen sulfide. Pigs that ate feed containing hydrogen sulfide experienced diarrhea for a few days and lost weight after about 105 days.

Scientists have little information about what happens when you are exposed to hydrogen sulfide by getting it on your skin, although they know that care must be taken with the compressed liquefied product to avoid frost bite.

How likely is hydrogen sulfide to cause cancer?

Hydrogen sulfide has not been shown to cause cancer in humans, and its possible ability to cause cancer in animals has not been studied thoroughly. The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have not classified hydrogen sulfide for carcinogenicity.

How can hydrogen sulfide affect children?

Children are likely to be exposed to hydrogen sulfide in the same manner as adults, except for adults at work. However, because hydrogen sulfide is heavier than air and because children are shorter than adults, children sometimes are exposed to more hydrogen sulfide than adults. Health problems in children who have been exposed to hydrogen sulfide have not been studied much. Exposed children probably will experience effects similar to those experienced by exposed adults. Whether children are more sensitive to hydrogen sulfide than adults or whether hydrogen sulfide causes birth defects in people is not known.

How can families reduce the risk of exposure to hydrogen sulfide?

Families can be exposed if they live near natural or industrial sources of hydrogen sulfide, such as hot springs, manure holding tanks, or pulp and paper mills. Families may want to restrict visits to these places.

Is there a medical test to show whether I've been exposed to hydrogen sulfide?

Hydrogen sulfide can be measured in exhaled air, but samples must be taken within 2 hours after exposure to be useful. A more reliable test to determine if you have been exposed to hydrogen sulfide is the measurement of thiosulfate levels in urine. This test must be done within 12 hours of exposure. Both tests require special equipment, which is not routinely available in a doctor's office. Samples can be sent to a special laboratory for the tests. These tests can tell whether you have been exposed to hydrogen sulfide, but they can not determine exactly how much hydrogen sulfide you have been exposed to or whether harmful effects will occur.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set an acceptable ceiling limit for hydrogen sulfide of 20 parts hydrogen sulfide per 1 million parts of air (20 ppm) in the workplace.

The National Institute for Occupational Safety and Health (NIOSH) recommends a 10-minute ceiling limit of 10 ppm in the workplace.

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2006. Toxicological Profile for Hydrogen Sulfide (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

CALIFORNIA CRUDE OIL PRODUCTION AND IMPORTS

STAFF PAPER

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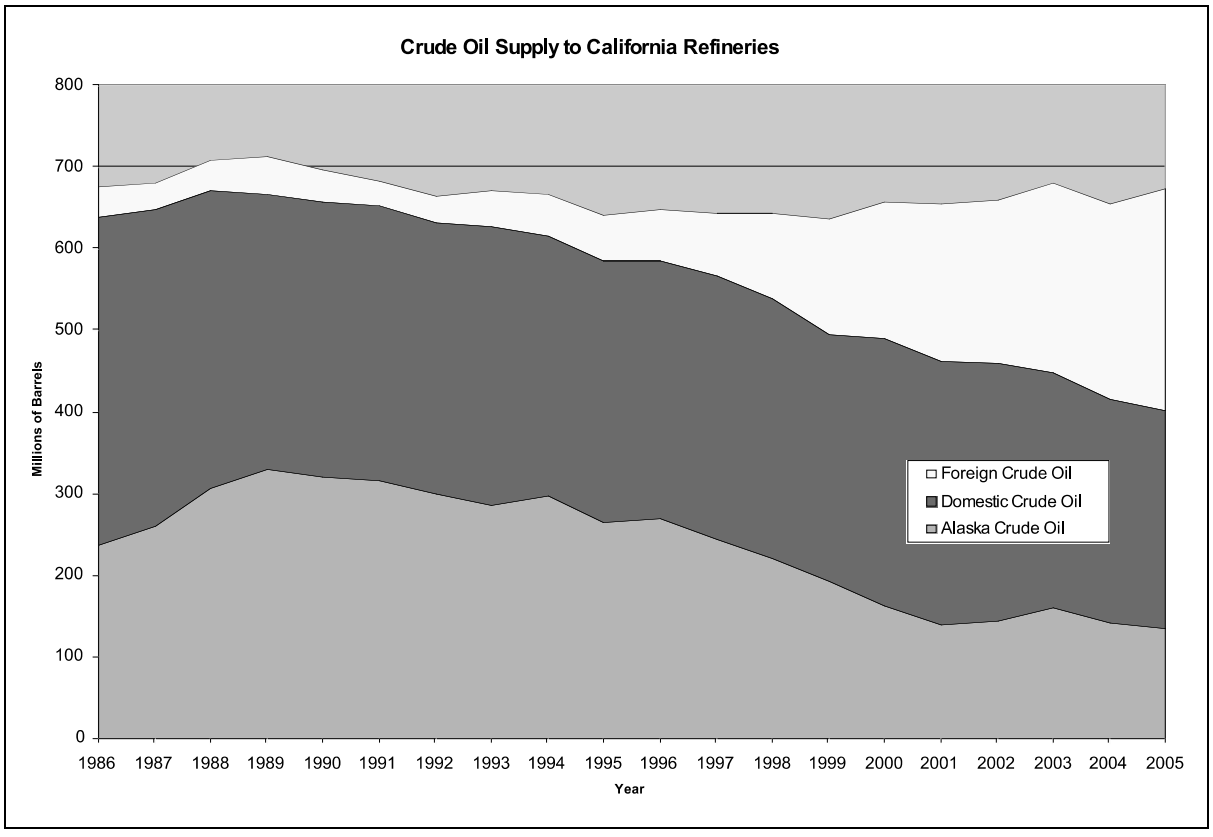
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CALIFORNIA CRUDE OIL PRODUCTION AND IMPORTS

Introduction

Californians consume nearly 44 million gallons of gasoline and 10 million gallons of diesel every day.[1] California refineries produce these fuels and other products from crude oil and blending components. Transportation fuel production in California depends on the availability and quality of the crude oils used by refineries in the state. Figure 1 shows the average annual refinery receipts of crude oil from 1986 to 2005. The supply of crude oil to California refineries has changed substantially in the last 10 years. Most notably, receipts of foreign crude oil have increased as production sources from California and Alaska have continued to decline.

Figure 1



Source: Petroleum Industry Information Reporting Act

Historically, California has been relatively self-reliant in petroleum supplies. However, crude oil production in California has decreased by 23 percent since 1996.[2] This decline of supply in the state has increased reliance on foreign and domestic imports. Starting in 1994, California refineries received more imported

crude oil than in-state sources. In 2005, California crude oil accounted for approximately 37 percent of the total receipts.

The quality of the crude oil used by the refinery in conjunction with the complexity of processing units dictates the percentages of products produced. For example, lower quality crude oil is more difficult to refine into lighter products, such as motor and aviation gasoline. Refineries have minimum crude oil quality requirements that are determined by the processing units in the plant.

This paper presents information on crude oil characteristics, California crude oil production trends, and their possible impact on future transportation fuel production.

Crude Oil Characteristics

The quality of crude oil is determined by a number of characteristics that affect the proportions of transportation fuels and petroleum products produced when the oil is refined. The two most common measurements of crude oil quality are the specific gravity (which is measured in degrees) and the sulfur content of the oil. Acid content is also a factor in determining the corrosive properties of the crude oil entering the refinery.

Specific Gravity

The specific gravity is typically measured using the American Petroleum Institute (API) standard or the API gravity of the crude oil. The API gravity is the measure of the weight of crude oil in relation to the weight of water (water has an API gravity of 10 degrees). Crude oil is characterized as heavy, intermediate, or light with respect to its API gravity.

- Heavy Crude: Crude oils with API gravity of 18 degrees or less is characterized as heavy. The oil is viscous and resistant to flow, and tends to have a lower proportion of volatile components. Fifty one percent of California crude oil has an average API of 18 degrees or less.

- Intermediate Crude: Crude oils with an API greater than 18 and less than 36 degrees are referred to as intermediate. Forty eight percent of California crude oil has an average API between 18 and 36 degrees.

- Light Crude: Crude oils with an API gravity of 36 degrees or greater. Light crude oil produces a higher percentage of lighter, higher priced premium products.

Sulfur Content

Crude oil is defined as “sweet” if the sulfur content is 0.5 percent or less by weight and “sour” if the sulfur content is greater than 1.0 percent. Sulfur compounds in crude oil are chemically bonded to hydrocarbon molecules in the oil. Additional equipment in the refinery is required to remove the sulfur from crude oil, intermediate hydrocarbon feedstocks, and finished products. Transportation fuel specifications require extremely low sulfur contents, usually less than 80 parts per million (ppm).

Acid Content

Another characteristic of crude oil is the total acid number (TAN). The TAN represents a composite of acids present in the oil and is measured in milligrams (mg). A TAN number greater than 0.5 mg is considered high.[3] As an example, Wilmington and Kern crude oil have a TAN ranging from 2.2 to 3.2 mg, respectively.[4] However, some acids are relatively inert. Thus, the TAN number does not always represent the corrosive properties of the crude oil. Further, different acids will react at different temperatures – making it difficult to pinpoint the processing units within the refinery that will be affected by a particular high TAN crude oil. Nonetheless, high TAN crude oils contain naphthenic acids, a broad group of organic acids that are usually composed of carboxylic acid compounds. These acids corrode the distillation unit in the refinery and form sludge and gum which can block pipelines and pumps entering the refinery.[5]

The impact of corrosive, high TAN, crude oils can be overcome by blending higher and lower TAN oils, installing or retrofitting equipment with anticorrosive materials, or by developing low temperature catalytic decarboxylation processes using metal catalysts such as copper. Many California refineries already process high TAN crude. High TAN oils are sold on the market at a discount compared to higher quality crude oils.

High TAN oils account for an increasing percentage of the global crude oil market. Crude oil with a TAN greater than 1.0 mg increased in the world market from 7.5 percent in 1998 to 9.5 percent in 2003.[6]

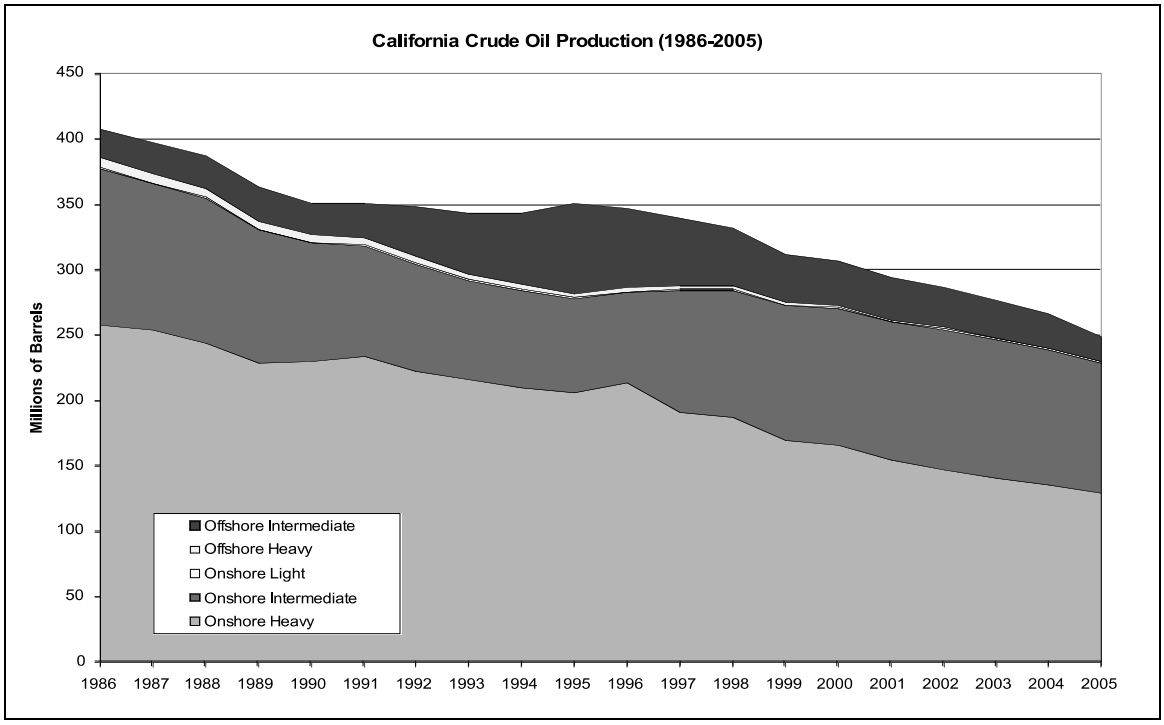
California Crude Oil Production

The discovery of oil in Kern County in the late 19th century heralded a long history of oil production in California. At the turn of the 20th century, crude oil was valued primarily for the heavier products and refining was oriented towards the production of heating oil and lubricants. In the early 1900s, with growing automobile use, gasoline became a more important commodity.

California is currently ranked fourth in the nation among oil producing states, behind Louisiana, Texas, and Alaska, respectively. Crude oil production in California averaged 731,150 barrels per day in 2004, a decline of 4.7 percent from 2003. Statewide oil production has declined to levels not seen since 1943.[7]

Figure 2 shows California onshore and offshore crude oil production over the last 20 years. The production of heavy, intermediate, and light crude oil production are broken out for onshore and offshore (or Outer Continental Shelf [OCS]) areas.

Figure 2



Sources: California Department of Conservation, Minerals Management Service

Production peaked in California in 1983. Production has declined at an average rate of 2.4 percent per year in the last 10 years.

Figure 2 shows a constant decline in onshore heavy crude oil production from 1986 through 2005 of 6.8 million barrels per year, or approximately 3.5 percent per year. Intermediate onshore oil production remained relatively flat. Offshore crude oil production peaked at 72 million barrels in 1995 and has declined by around 4.3 million barrels per year - or 10.2 percent per year - from 1995 through 2004.

The three major regions of California crude oil production are Kern County, the Los Angeles Basin, and the Outer Continental Shelf (OCS).

- **Kern County:** In 2004, oil from Kern County accounted for 77 percent of California's total onshore production and over 69 percent of the state's total oil production.[8] Approximately 58 percent of the crude oil has an API of 18 degrees or less. The Kern River oil field, located in the eastern San Joaquin Valley, accounts for approximately 24 percent of Kern County oil. Kern River oil is characteristically heavy and sour with an API of 13.4 degrees and a sulfur content of 1.2 percent.[9]

- **Los Angeles Basin:** The Los Angeles Basin is a sedimentary plain extending from central Los Angeles south through the Long Beach area. The two largest fields by area in this region are the Wilmington and the Huntington Beach fields with average APIs of 17.1 and 19.4 degrees, and average sulfur contents of 1.7 and 2.0 percent, respectively.

- **Outer Continental Shelf:**[10] The Federal Minerals Management Service oversees crude oil rigs located three nautical miles or greater from the coast. The OCS rigs accounted for 10.2 percent of the total California production in 2004. Many of these rigs are leased to commercial companies with pipelines extending to onshore processing facilities. The quality of OCS crude oil varies by field. Both sweet and sour OCS crude oils have API gravities ranging from 14 to 38 degrees.[11] Intermediate crude oil with an API gravity between 18 and 36 degrees accounted for 96.6 percent of the OCS production in 2004.

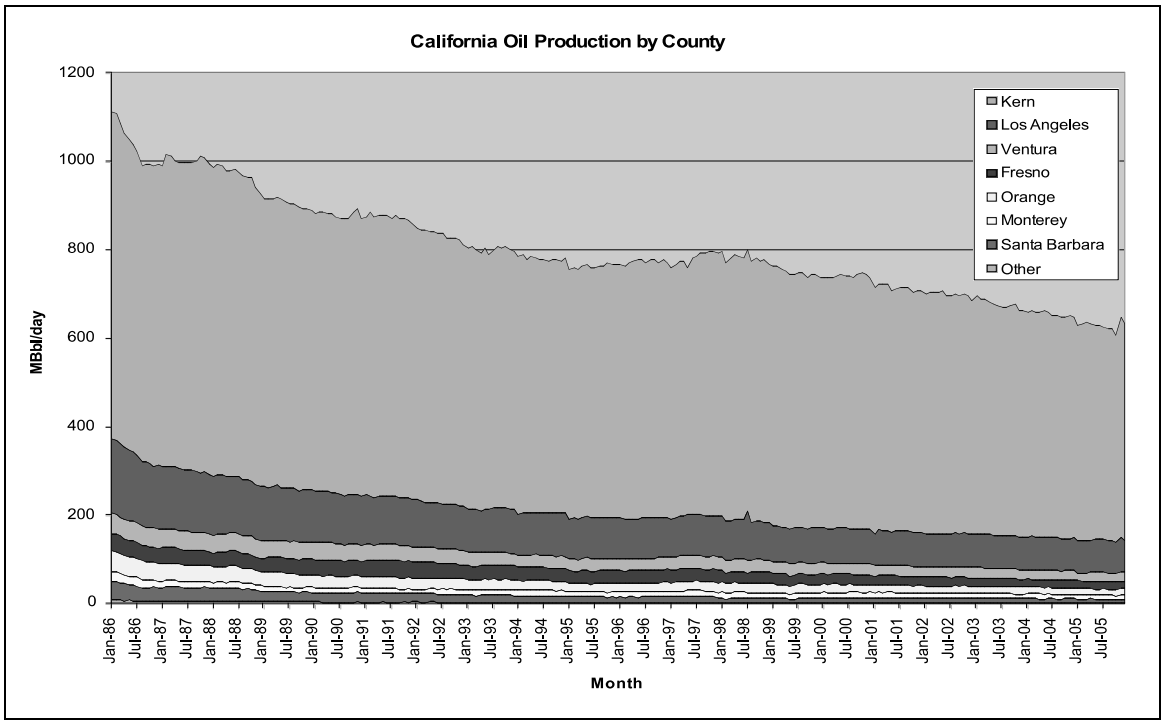
Table 1 shows an assay of selected California crude oils.[12] The table provides the percentages of 2005 production to show the relative importance of the field. The distillation breakdown of each crude oil provides a general guideline of the refining product suite that would result after the initial crude distillation has been completed. The actual ratio of finished refined products will vary depending on the complexity of the refinery. Note that unrecoverable gas losses occur in the assay, resulting in distillation product summations of less than 100 percent.

Table 1

County	Field	Percent of 2005 Production	API Gravity & Sulfur	Distillation breakdown (percent per volume) Total Gasoline & Naptha	Middle Distillates	Residuum	Lubes
Kern & San Luis Obispo	Midway Sunset	18.47%	12.6, 1.6%	0.00%	12.00%	50.30%	34.80%
Kern	Kern River	14.36%	13.3, 1.1%	0.00%	15.80%	56.10%	28.10%
Kern	Elk Hills	7.91%	34.6, 0.8%	34.30%	23.30%	25.00%	15.90%
Los Angeles	Wilmington	6.49%	17.1, 1.7%	9.50%	18.20%	52.80%	19.40%
Kern	Lost Hills	4.96%	18.4, 1.0%	7.60%	23.50%	42.70%	23.20%
Ventura	Ventura	1.75%	30.2, 1.0%	30.20%	20.80%	31.30%	16.30%
Kern	Belridge N. Lt.	1.63%	31.3, 0.3%	25.70%	25.70%	26.30%	20.90%
Monterey	San Ardo	1.52%	12.2, 2.3%	2.10%	14.50%	62.50%	20.50%
Los Angeles	Inglewood	1.24%	21.0, 1.8%	12.90%	27.60%	39.10%	19.40%
Orange	Huntington Beach	1.07%	19.4, 2.0%	12.00%	19.70%	48.90%	19.40%
Los Angeles	Long Beach	0.65%	25.0, 1.3%	18.90%	23.10%	40.60%	17.40%
Kern	Mount Poso	0.26%	16.0, 0.7%	0.00%	13.40%	52.00%	34.00%

Figure 3 shows the onshore production by county.

Figure 3



Source: Dept. of Conservation

California commonly uses Thermally Enhanced Oil Recovery (TEOR) techniques to help maintain crude oil production, because heavy, viscous crude oil requires heating to move the oil to the pump. Direct injection steaming and intermittent steaming are two types of TEOR. California crude oil production is also enhanced by injection of water (water flooding) and even carbon dioxide (CO_2) to help maintain sufficient pressure in the crude oil field. In the absence of more aggressive use of TEOR, California's crude oil production is expected to continue to decline at a rate of 3.5 percent per year through 2019.[13]

Well activity provides an indication of potential production in the state. In 2004, drilling increased to 2,451 wells, a 6.7 percent increase from 2003. The number of plugged wells decreased to 2,039 from 2,501 in 2003. Drilling and plugging activities in the state have fluctuated by more than 900 wells from year to year; however, the general trend is relatively flat.

Alaska North Slope Crude Oil

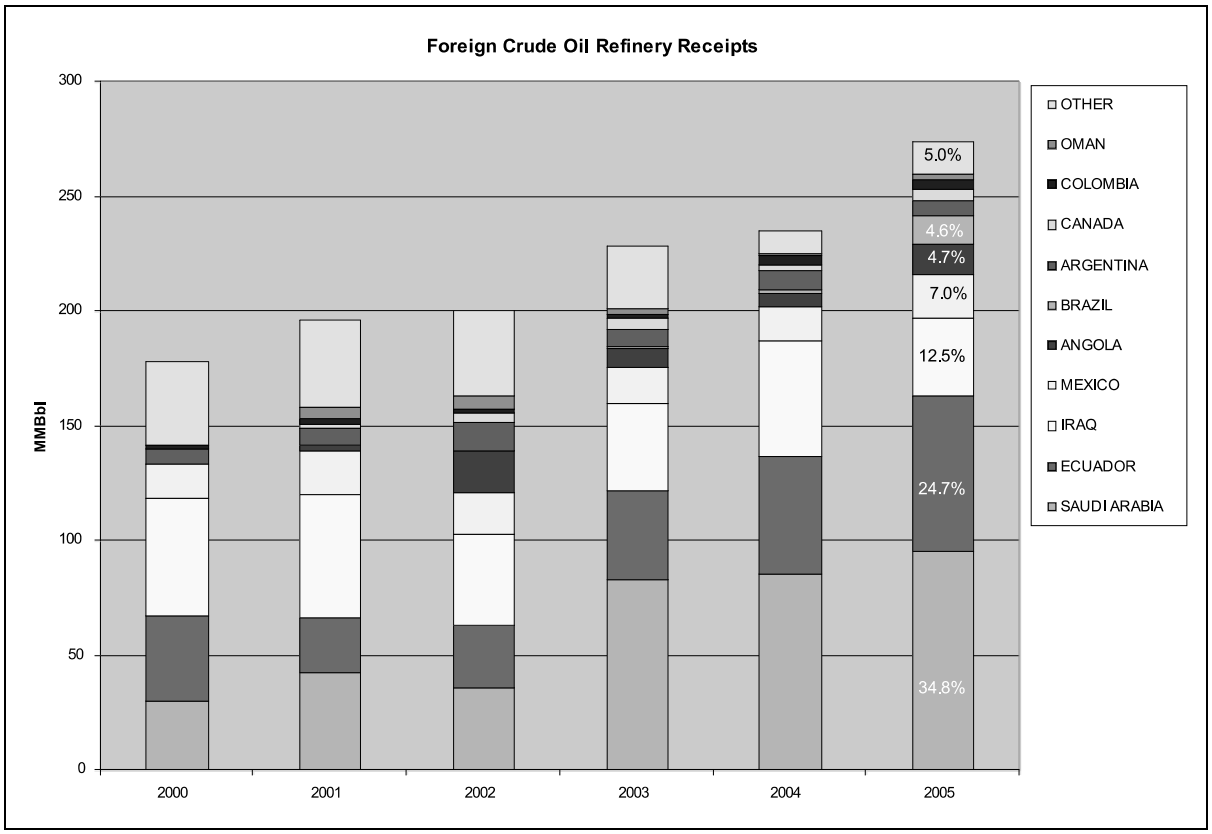
In 2005, California imported 21 percent of its total crude oil supply from Alaska. Oil fields in Alaska's North Slope produce a wide range of crude oils. API gravities from different fields range from 22 to 40 degrees. Alaskan refineries located along the Trans Alaska Pipeline System (TAPS) "top" the crude oil to produce light petroleum products and return residual products to the line. The resulting blended crude oil stream is referred to as Alaska North Slope oil (ANS). The ANS is an intermediate sour crude with an average API gravity of 29-29.5 degrees and sulfur content of 1.1 percent.

Like California crude oils, ANS production has been declining in the last 10 years. The average annual rate of decline in ANS production is approximately 5 percent per year.

Foreign Crude Oil Imports

The majority of crude oil imports to California are from the Middle East, Central America, and South America. Figure 4 shows a six year history of imports by region.

Figure 4



Source: Energy Information Administration

Crude oil imported from countries with volatile political and social structures leaves California vulnerable to changing world events. For example, attacks on Nigerian oil industry personnel led to the recent shutdown of nearly 9 percent of Nigeria's total oil production, which could impact global oil availability and increase feedstock costs for California refineries. Also, the growing political tension between the U.S. and Iranian governments over Iran's nuclear program could impact California's crude oil supply if the U.S. decides to impose sanctions on Iran.

Table 2 shows approximate crude oil characteristics for several imported crude oils.[14]

Table 2

Crude source	Paraffins Percent Volume)	Aromatics (Percent Volume)	Naphthenes (Percent Volume)	Sulfur (Percent Weight)	API gravity (Approx.)	Napht. yield (Percent Volume)	Octane No. (Typical)
Nigerian - Light	37	9	54	0.2	36	28	60
Saudi - Light	63	19	18	2	34	22	40
Saudi - Heavy	60	15	25	2.1	28	23	35
Venezuela - Light	35	12	53	2.3	30	2	60
Venezuela - Heavy	52	14	34	1.5	24	18	50
North Sea - Brent	50	16	34	0.4	37	31	50

Source: Office of Safety and Health Administration

The API gravity of refinery imports reported to the Energy Commission through the Petroleum Industry Information Reporting Act (PIIRA)[15] show an increase of 0.27 API per year from 1996 to 2005 for larger refineries. Smaller refineries show a relatively flat API during the same time period, predominantly because these smaller refineries solely use crude oil from California sources.[16]

Crude Oil Supply and Distribution to California Refineries

The distribution of domestic and imported crude oils is dependent on the port, pipeline, truck, and rail transport infrastructure within the state. All ANS and imported crude oils enter the state through ports in Los Angeles, Long Beach, and the Bay Area.

Water depth limits access to Bay Area ports. The water depth of these ports is typically between 32 to 45 feet, which is too shallow for large crude oil carriers. As an example, a carrier with a capacity of 1.3 million barrels will require a minimum water depth of at least 66 feet. For shallower ports, large vessels will anchor in a designated zone outside of the ports and smaller barges will transfer oil to the ports, a practice referred to as “lightering.” This practice adds to the delivery cost of crude oil to the refinery and increases the risk of accidental release of crude oil into the environment.

Another complication for the Bay Area ports is silting in the bays. Dredging of the bays is controversial in that habitat is disturbed and dredged material must be disposed of in an environmentally sound manner. For example, approximately 4 million cubic yards of sediment are dredged from the Central and South Bay per year.[17]

Pipeline networks tie the San Joaquin Valley crude oil production with refineries in both the Los Angeles and the Bay Area. Figure 5 shows the major crude oil pipelines in California.

Figure 5



Source: California Energy Commission

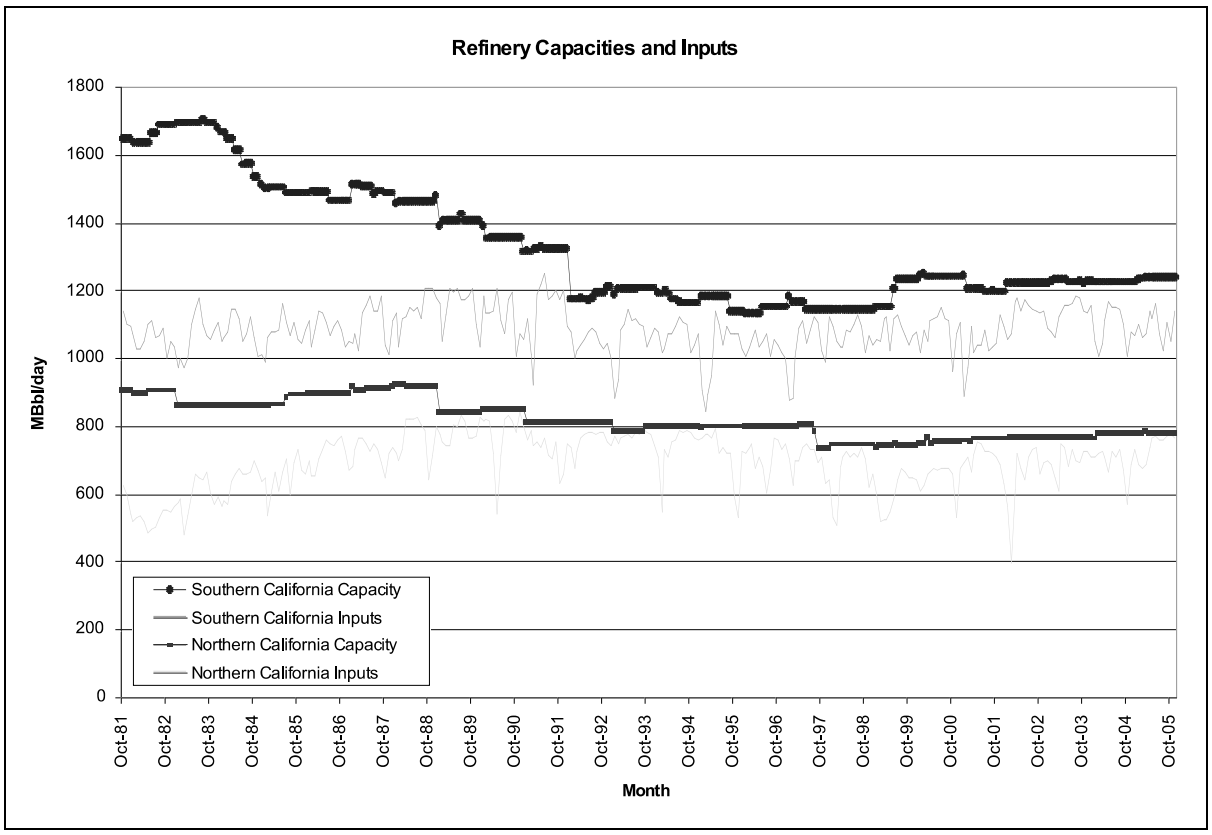
In California, 51 percent of the crude oil produced in the state is heavy crude. The transport of heavy crude through pipelines is complicated by the viscosity and inertia of the oil. Thus, some of the crude oil pipeline systems throughout the state require external heating. Booster stations are placed at intervals on the line where heating and/or pumping units facilitate the flow of the crude through the line. The proximity of booster stations is determined by the viscosity of the crude and by the average heat loss from the pipes from ambient weather conditions. Heavier crude oils are also blended with lighter crude oils to reduce viscosity, allowing transportation through pipelines without any heating.

Inland California crude oils are typically first piped to local refineries (Bakersfield and Santa Maria) because they are nearby and do not have port access. The balance of inland crude oils are piped to Northern and Southern California refineries.

Refinery Operations

In the last two decades, California refineries have been running increasingly closer to capacity levels. Figure 6 shows the total crude oil throughput refining capacity and the throughput oil inputs to the refinery by area.

Figure 6



Source: Petroleum Industry Information Reporting Act

The steady decline in refinery capacity during the 1980s and early 1990s is followed by a noticeable creep upward in the late 1990s and early 2000s. With refinery creep and greater import capabilities in the Los Angeles area, southern refineries are less constrained than their Bay Area and Central California counterparts. Southern California refineries also show an increasing level of crude oil imports.

Refinery operations must also consider recent diesel regulations by the U.S. Environmental Protection Agency (EPA) and the California Air Resources

Board (ARB). The EPA regulation lowers the allowable amount of sulfur in on-road diesel fuel from less than 500 parts per million (ppm) to less than 15 ppm. This requirement will take effect on June 1, 2006. The sulfur content and API gravity of crude oil input to the refinery in conjunction with the complexity of process units will affect the quantity of ultra-low sulfur diesel produced by the facility.

The hydrocracking and hydrotreater units remove sulfur within the refinery. Hydrocracking units break hydrocarbon molecules into lighter compounds in the presence of hydrogen. Hydrotreatment involves the chemical reaction of hydrocarbon compounds with hydrogen in the presence of a catalyst such as cobalt or alumina.[18]

Refineries throughout the U.S. are currently upgrading their desulfurization processes in order to meet the new diesel sulfur standards. This upgrade typically involves techniques such as changing the catalyst in the hydrotreater or installing booster pumps to force more feedstock through the unit. Both hydrocrackers and hydrotreaters also remove heavy metals and aromatics from the feedstock. This is particularly important in California where lower aromatic standards will be required along with the new ultra low sulfur diesel standards.

Findings

- The declining crude oil production in South-Central California has resulted in higher crude oil costs because of reliance on higher priced imported crude oils.

- Pipeline utilization rates are decreasing and the procurement of crude oil to inland refineries is becoming increasingly difficult as local supplies decline.

Current and Future Work

Additional reporting requirements in the Energy Commission's new petroleum industry data collection regulations will greatly enhance the agency's understanding of crude oil and finished product movements within the state. The addition of port, terminal, and pipeline information will provide the details needed to track infrastructure use within the state. This additional information will be essential in: assessing near-term petroleum infrastructure demand shifts, reviewing project expansion plans, and completing contingency studies.

Research and analysis should focus, in particular, on the following areas:

- Crude oil quality: The growing dependence of California refineries on imported crude oils requires a more detailed look at the characteristics of overseas crude oils entering ports in the state. The general trend of

international crude oil production reflects an increase in low API, high sulfur content crude oil. However, overall API gravity in California refineries has increased primarily from the decline in heavy California crude oil production. The examination of supply information from secondary sources and from PIIRA reporting data will help to identify areas of constraint in the state.

- Total Acid Number (TAN): The increase in world production of heavy, sour, and high TAN crude oils will impact California refineries. An assessment of the crude oil processing capabilities of California refineries is needed to understand the potential implications of future changes in the global crude oil market.

- Crude oil pipelines: The decrease in crude oil production in the state has led to changes in the utilization rates of some crude oil pipelines. Modifying current pipeline systems and/or making new investments in distribution infrastructure may be necessary to provide more stable sources of crude oil for refineries without port access.

Endnotes

[1] California State Board of Equalization data for 2004. Taxable gasoline figures amounted to an average of 43.5 million gallons per day, while taxable diesel fuel sales figures have been adjusted upward to reflect an estimated 22 percent distribution of exempt and refund diesel sales that are excluded from their taxable gallons.

[2] Based on data compiled from the California Department of Conservation database production files, http://www.conservation.ca.gov/DOG/prod_injection_db/index.htm and MMS Offshore data, http://www.gomr.mms.gov/homepg/pubinfo/pacificfreeasci/product/pacificfreeprod.html.

[3] http://rru.worldbank.org/Documents/publicpolicyjournal/275-bacon-tordo.pdf.

[4] http://www.pacificenergypier400.info/pdfs/CRUDESUP/PACIFICP.PDF.

[5] http://www.ornl.gov/sci/fossil/Publications/RECENT%20PUBS/DDSum2003.pdf.

[6] Anne Shafizadeh, Gregg McAteer, and John Sigmon, *High-Acid Crudes*, paper presented at Crude Oil Quality Group meeting, New Orleans, January 30, 2003, [http://www.coqg.org/20030130special.asp]

[7] ftp://ftp.consrv.ca.gov/pub/oil/annual_reports/2004/PR06_Annual_2004.pdf.

[8] California Department of Conservation database production files, http://www.conservation.ca.gov/DOG/prod_injection_db/index.htm.

[9] Van Vector, Samuel, *Pricing Royalty Crude Oil*, http://www.econ.com/apijan00.pdf.

[10] MMS data for 2004 is approximately 95 percent complete. December 2005 data not yet posted.

[11] Jokuty, P.; Whiticar, S.; Wang, Z.; Fieldhouse, B.; and Fingas, M.; *A Catalogue of Crude Oil and Oil Product Properties for the Pacific Region,* 264p 1999.

[12] http://www.econ.com/apijan00.pdf.

[13] http://www.energy.ca.gov/2005_energypolicy/documents/2005-0516_workshop/presentations/Baker%20&%20OBrien%20Presentation%205-16-05.pdf.

[14] OSHA Technical Manual – Section IV: Chapter 2, http://www.osha-slc.gov/dts/osta/otm/otm_iv/otm_iv_2.html.

[15] PIIRA: the Petroleum Industry Information Reporting Act, Public Resources Code 25350 et seq.

[16] Large and small refineries are defined here as refineries with crude oil receipts in 2005 greater than or less than 5 percent of the total for the state, respectively.

[17] http://www.spn.usace.army.mil/ltms/chapter2.pdf.

[18] http://www.bp.com/genericarticle.do?categoryId=2013107&contentId=2019673.

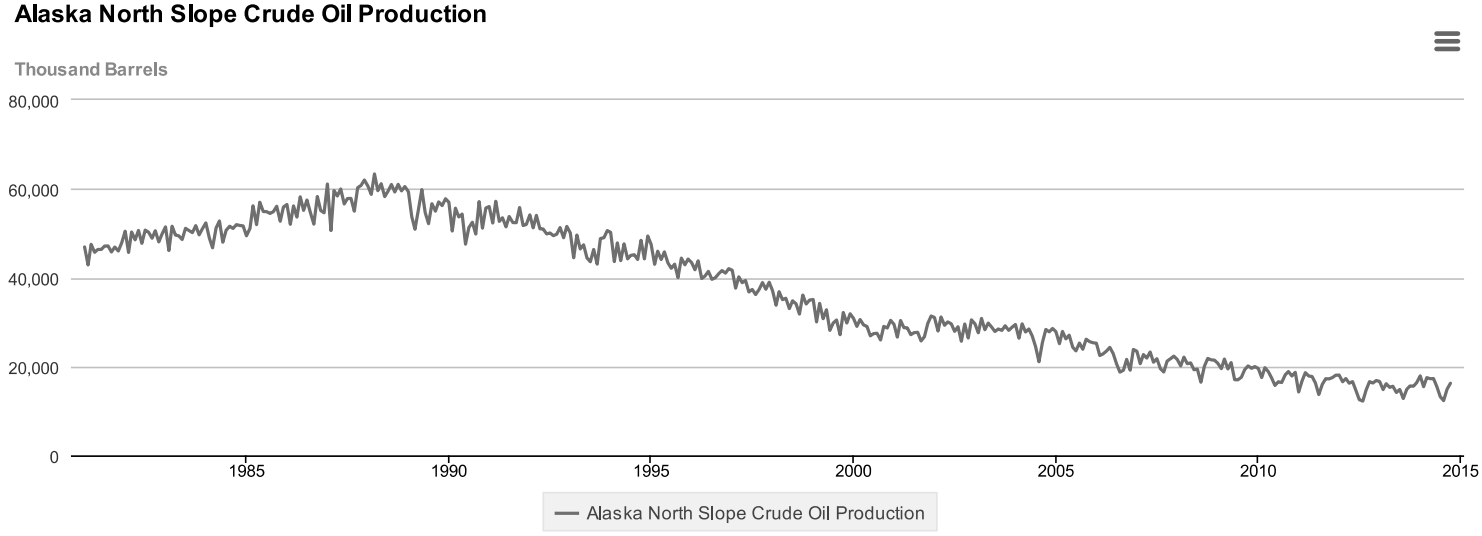
U.S. Energy Information Administration

PETROLEUM & OTHER LIQUIDS

View History: Monthly Annual

Download Data (XLS File)

Alaska North Slope Crude Oil Production



Source: U.S. Energy Information Administration

Chart Tools

no analysis applied

Alaska North Slope Crude Oil Production (Thousand Barrels)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1981	46,909	42,829	47,507	45,677	46,344	46,325	47,107	47,117	45,759	46,890	45,987	47,814
1982	50,450	45,656	50,262	48,518	50,621	47,707	50,695	50,247	48,876	50,565	48,033	49,876
1983	51,426	46,070	51,549	49,572	49,401	48,586	51,107	50,600	50,111	51,695	49,609	51,032
1984	52,340	48,897	46,683	51,158	52,743	47,978	50,665	51,559	51,070	51,934	51,750	51,641
1985	49,406	51,106	56,184	51,934	56,992	54,902	54,845	54,441	54,841	56,065	52,675	55,896
1986	56,471	52,015	56,132	53,605	58,207	55,142	57,471	54,691	52,038	58,277	55,087	54,600
1987	61,091	50,595	59,614	58,389	59,979	56,565	57,801	57,833	54,952	60,249	60,745	61,994
1988	60,633	58,761	63,361	59,575	61,149	58,234	59,434	60,962	59,277	61,028	59,520	60,513
1989	59,347	53,739	50,889	55,404	59,820	54,621	52,138	56,657	54,971	57,044	56,218	57,764
1990	56,989	50,473	55,643	53,676	54,322	47,542	51,289	52,469	49,810	57,126	51,135	55,691
1991	56,005	52,282	57,199	52,645	53,488	51,425	53,753	52,389	52,363	55,794	51,699	51,965
1992	54,135	51,191	54,010	50,976	50,940	49,843	50,049	49,424	49,775	51,271	48,967	51,537
1993	50,045	44,480	49,583	46,430	47,391	44,444	43,549	46,356	43,037	48,773	48,978	50,580
1994	50,186	43,605	47,808	43,830	47,584	44,214	45,016	45,136	44,059	48,382	44,227	49,360
1995	47,502	42,995	45,945	44,066	45,802	43,295	42,084	43,005	40,005	44,382	42,879	44,178
1996	43,387	41,763	43,792	39,786	40,311	41,380	39,578	39,958	40,879	41,579	40,985	42,018
1997	41,667	37,664	40,159	38,882	39,363	36,796	37,363	36,194	37,347	38,893	37,392	38,995
1998	37,078	33,776	36,861	35,059	35,372	33,040	34,804	34,109	31,815	36,099	34,068	34,969
1999	35,104	30,042	34,206	30,760	32,790	28,135	29,793	30,453	27,154	32,180	29,787	31,878
2000	30,816	29,021	30,571	29,348	29,025	26,890	27,412	27,461	25,946	29,026	28,682	30,407
2001	29,515	26,608	30,375	28,750	28,717	27,158	27,632	27,691	25,740	26,682	29,668	31,378
2002	31,050	27,969	31,147	29,275	30,056	29,596	27,895	28,962	25,678	29,561	26,384	30,506
2003	29,595	27,588	30,817	28,273	29,795	28,880	27,872	28,455	28,119	29,189	28,142	28,840

2004	29,470	26,357	29,596	27,780	28,448	26,877	24,455	21,042	25,452	28,351	27,811	28,576
2005	27,852	25,124	27,922	26,216	27,053	24,333	23,524	25,295	23,858	26,126	25,618	25,355
2006	25,226	22,476	22,781	23,478	24,320	22,911	20,576	18,720	19,151	21,615	19,154	23,837
2007	23,441	20,639	22,667	21,878	23,251	20,966	21,734	19,508	18,735	21,201	21,755	22,333
2008	21,605	20,114	22,112	20,628	20,802	19,244	19,396	16,460	20,038	21,813	21,488	21,404
2009	20,687	19,498	21,654	19,445	20,895	17,015	16,988	17,561	19,301	20,110	19,596	19,991
2010	19,537	17,496	19,707	18,858	17,415	15,727	16,563	16,359	18,116	18,855	17,836	18,668
2011	14,242	16,820	18,617	17,863	17,734	16,275	13,677	15,978	17,227	17,203	17,485	18,018
2012	18,051	16,554	17,290	16,230	16,597	14,483	12,524	12,198	14,710	16,597	16,258	16,841
2013	16,628	14,796	16,131	15,289	15,546	14,143	14,814	12,767	14,840	15,622	15,549	16,364
2014	17,878	15,439	17,482	17,220	17,265	15,441	13,181	12,290	14,886	16,217		

- = No Data Reported; -- = Not Applicable; NA = Not Available; W = Withheld to avoid disclosure of individual company data.

Release Date: 12/30/2014
Next Release Date: Last Week of January 2015

Referring Pages:

- Crude Oil Production

crudemonitor.ca

Access Western Blend (AWB)

What is Access Western Blend crude?

Access Western Blend (AWB) is a heavy, high TAN dilbit produced by Devon Energy Canada and MEG Energy Corp. Production is from the Athabasca region south of Fort McMurray, Alberta. Production is generated by SAGD thermal methods. Diluent is supplied to the production sites from Edmonton and dilbit is pumped back to Edmonton on the Access Pipeline. AWB is available for upgrading in the Edmonton area, and for export on the Enbridge and Kinder Morgan systems.



Most Recent Sample Comments: AWB-931, Oct 1, 2014

Last 6 Samples

Other than marginally reduced BTEX, the October sample of Access Western Blend was conssitent with historical trends. Typical simulated distillation results are included.

Monthly Reports

Basic Analysis

Property	Most Recent Sample	6 Month Average	1 Year Average	5 Year Average
Density *(kg/m^3)*	927.8	925.6	922.7	923.5
Gravity *(^{o}API)*	20.9	21.3	21.7	21.6
Sulphur *(wt%)*	4.03	3.96	3.95	3.94
MCR *(wt%)*	11.10	10.82	10.73	10.69
Sediment *(ppmw)*	129	106	104	139
TAN *(mgKOH/g)*	1.66	1.70	1.68	1.69
Salt *(ptb)*	5.7	4.8	4.1	6.0
Nickel *(mg/L)*	72.0	73.7	73.1	73.0
Vanadium *(mg/L)*	187.0	187.4	187.5	193.1
Olefins *(wt%)*	-	-	-	ND

*ND indicates a tested value below the instrument threshold.

Trend Charts

Open fullscreen charts

Choose a property: Density (kg/m^3)

Light Ends Summary

Property *(vol%)*	Most Recent Sample	6 Month Average	1 Year Average	5 Year Average
C3-	0.05	0.05	0.05	0.04
Butanes	0.75	0.68	0.68	0.69
Pentanes	10.27	10.18	10.30	8.74
Hexanes	6.04	6.49	6.68	6.73
Heptanes	3.78	3.84	3.95	4.24
Octanes	2.21	2.10	2.11	2.45
Nonanes	1.12	1.02	0.98	1.17
Decanes	0.43	0.46	0.44	0.51

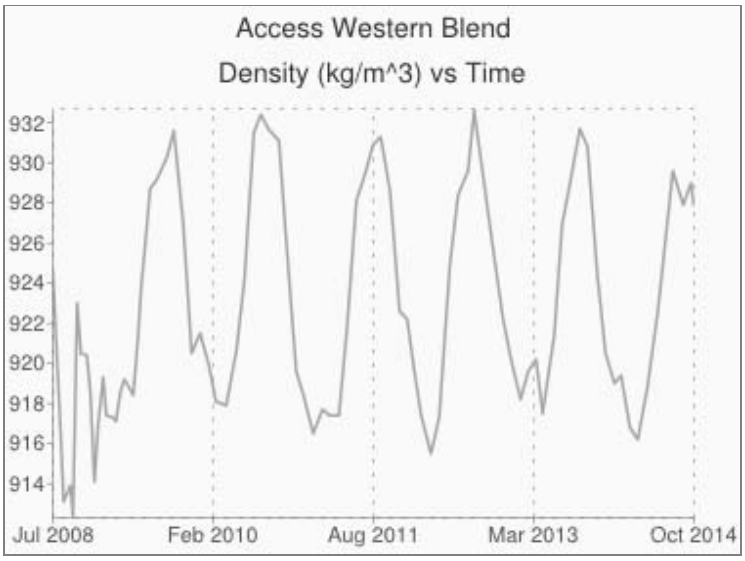
BTEX

Property *(vol%)*	Most Recent Sample	6 Month Average	1 Year Average	5 Year Average
Benzene	0.17	0.24	0.25	0.29
Toluene	0.30	0.39	0.41	0.49
Ethyl Benzene	0.03	0.04	0.04	0.05
Xylenes	0.21	0.28	0.29	0.38

Distillation

TBP	ASTM D2892 & D5236	Select an assay date...
HTSD	ASTM D7169	Most Recent Sample Historical Average

Export Access Western Blend Data



Select all properties for export
or select specific properties using adjacent checkboxes
Export custom report in xls: Download

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Investor Update
Third Quarter 2014

Cautionary Statement

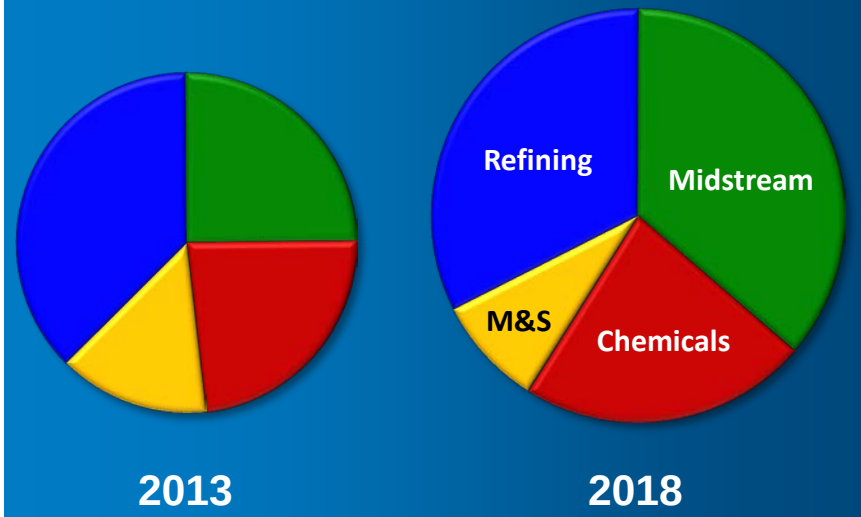
This presentation contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended, which are intended to be covered by the safe harbors created thereby. Words and phrases such as “is anticipated,” “is estimated,” “is expected,” “is planned,” “is scheduled,” “is targeted,” “believes,” “intends,” “objectives,” “projects,” “strategies” and similar expressions are used to identify such forward-looking statements. However, the absence of these words does not mean that a statement is not forward-looking. Forward-looking statements relating to Phillips 66’s operations (including joint venture operations) are based on management’s expectations, estimates and projections about the company, its interests and the energy industry in general on the date this presentation was prepared. These statements are not guarantees of future performance and involve certain risks, uncertainties and assumptions that are difficult to predict. Therefore, actual outcomes and results may differ materially from what is expressed or forecast in such forward-looking statements. Factors that could cause actual results or events to differ materially from those described in the forward-looking statements include fluctuations in crude oil, NGL, and natural gas prices, and refining and petrochemical margins; unexpected changes in costs for constructing, modifying or operating our facilities; unexpected difficulties in manufacturing, refining or transporting our products; lack of, or disruptions in, adequate and reliable transportation for our crude oil, natural gas, NGL, and refined products; potential liability from litigation or for remedial actions, including removal and reclamation obligations, under environmental regulations; limited access to capital or significantly higher cost of capital related to illiquidity or uncertainty in the domestic or international financial markets; and other economic, business, competitive and/or regulatory factors affecting Phillips 66’s businesses generally as set forth in our filings with the Securities and Exchange Commission. Phillips 66 is under no obligation (and expressly disclaims any such obligation) to update or alter its forward-looking statements, whether as a result of new information, future events or otherwise.

This presentation includes non-GAAP financial measures. You can find the reconciliations to comparable GAAP financial measures at the end of the presentation materials or in the “Investors” section of our website.

Corporate Strategy

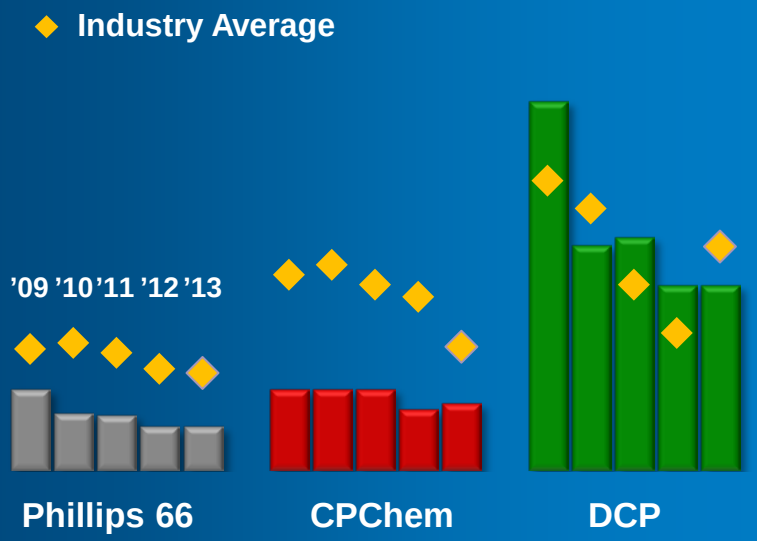
- Operating excellence
- Growth
- Returns
- Distributions
- High-performing organization

Enterprise Value

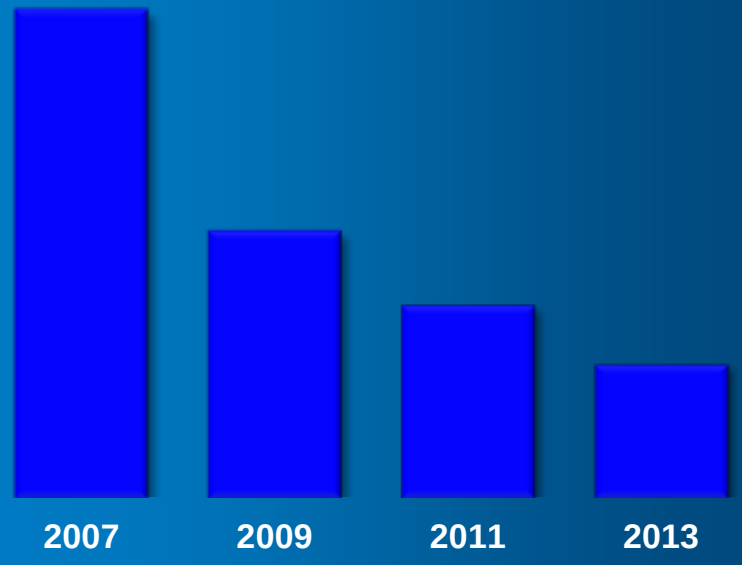


Operating Excellence

Total Recordable Rates
Incidents per 200,000 Hours Worked

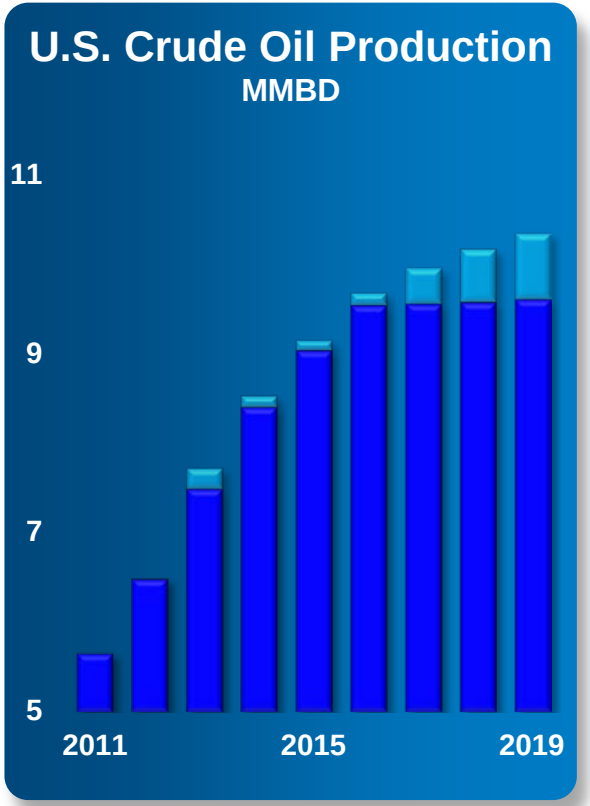


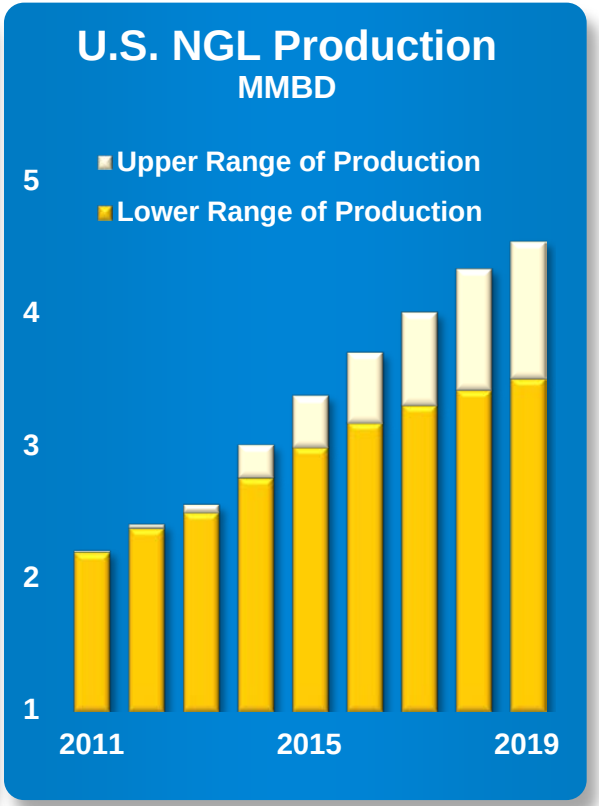
Refining Environmental Metrics

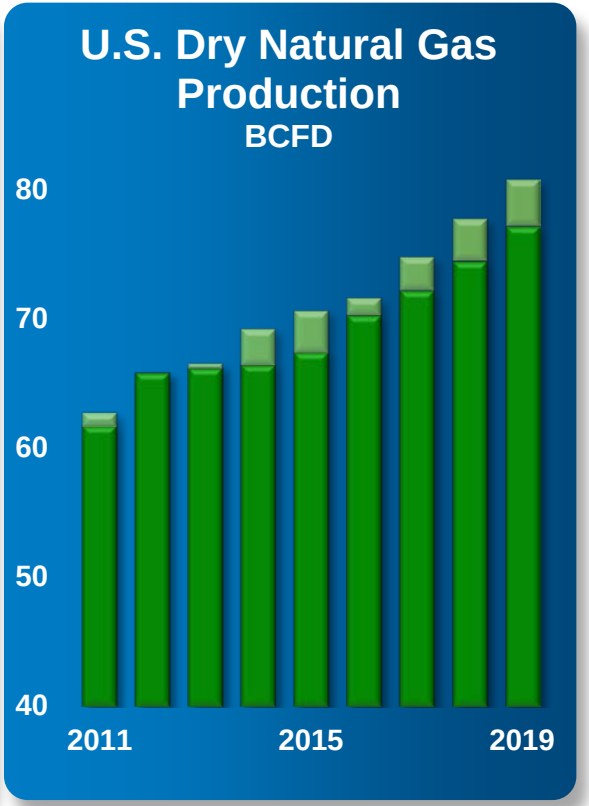


See appendix for footnotes.

U.S. Production Growth







Source: Industry consultants

Energy Landscape

North American oil and gas production growth

Energy infrastructure expansion

Global demand growth

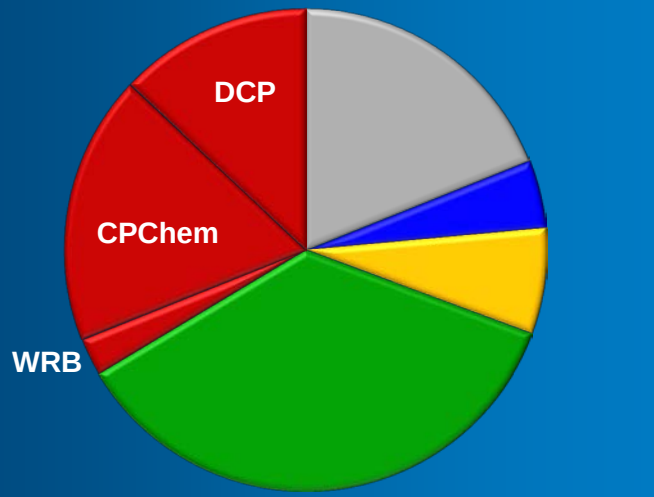
Regulatory environment

Major project execution



Capital Program

2014E Total Capital Program
$5.8 B



$3.9 B 2014E Phillips 66 capital

$2.7 B 2014E initial Phillips 66 capital

$1.2 B increase for Phillips 66 capital

$0.9 B acquisitions:
- Beaumont Terminal
- Spectrum Corporation
- Sweeny Cogen
- Explorer Pipeline ownership increase

$0.3 B organic growth acceleration:
- Sweeny Frac and LPG Export Terminal

$1.9 B 2014E JV capital (self-funded)

See appendix for footnotes.

Midstream

NGL

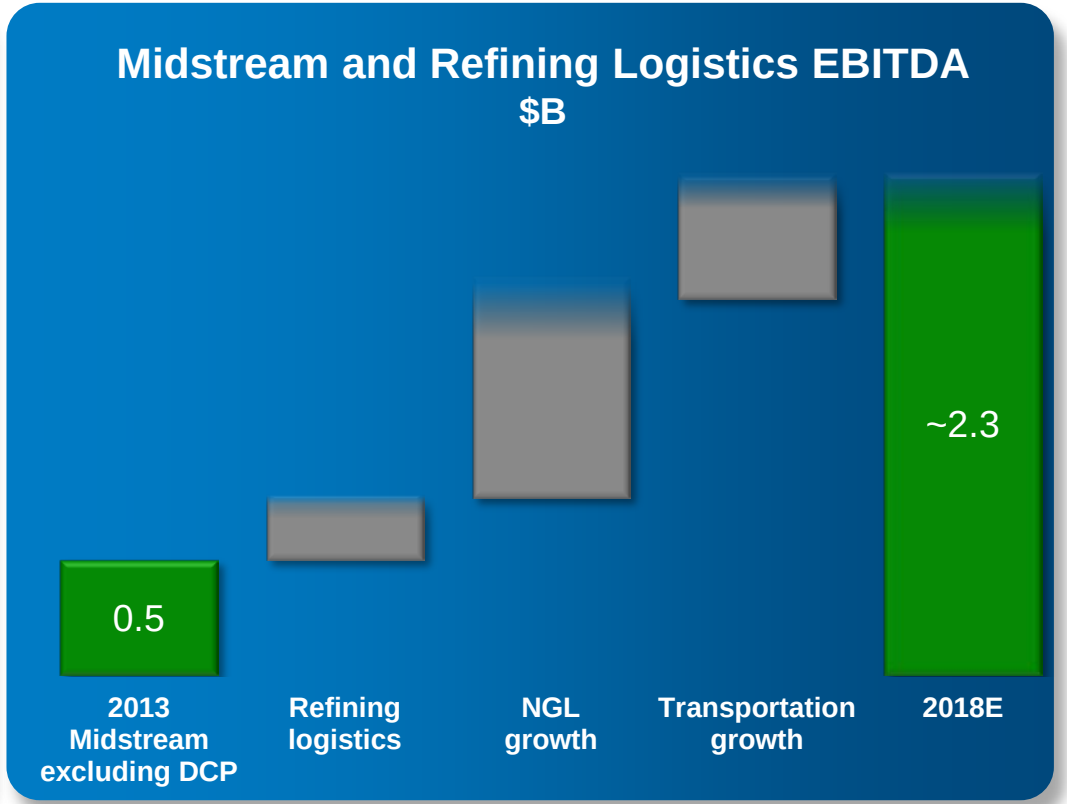
- Pipelines and fractionation
- Export terminals

Transportation

- Crude and product pipelines
- Terminals and storage
- Rail, marine and trucks

DCP Midstream

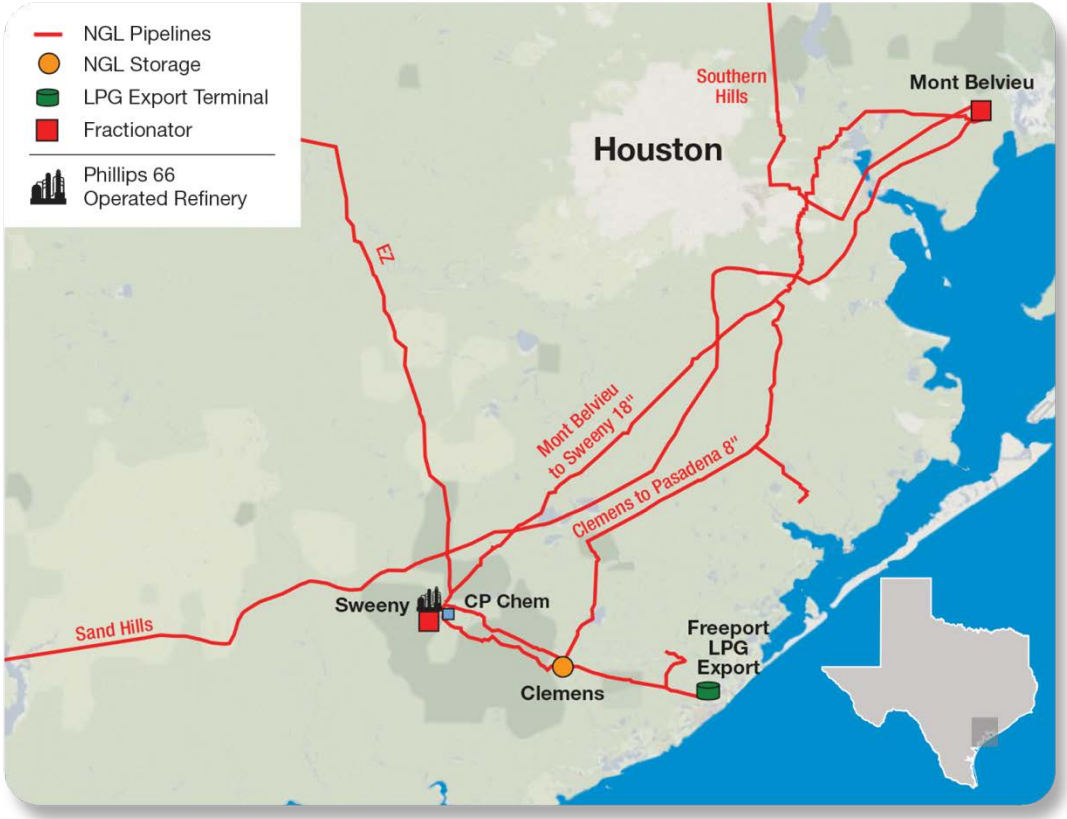
- Gathering and processing
- Pipelines and fractionation



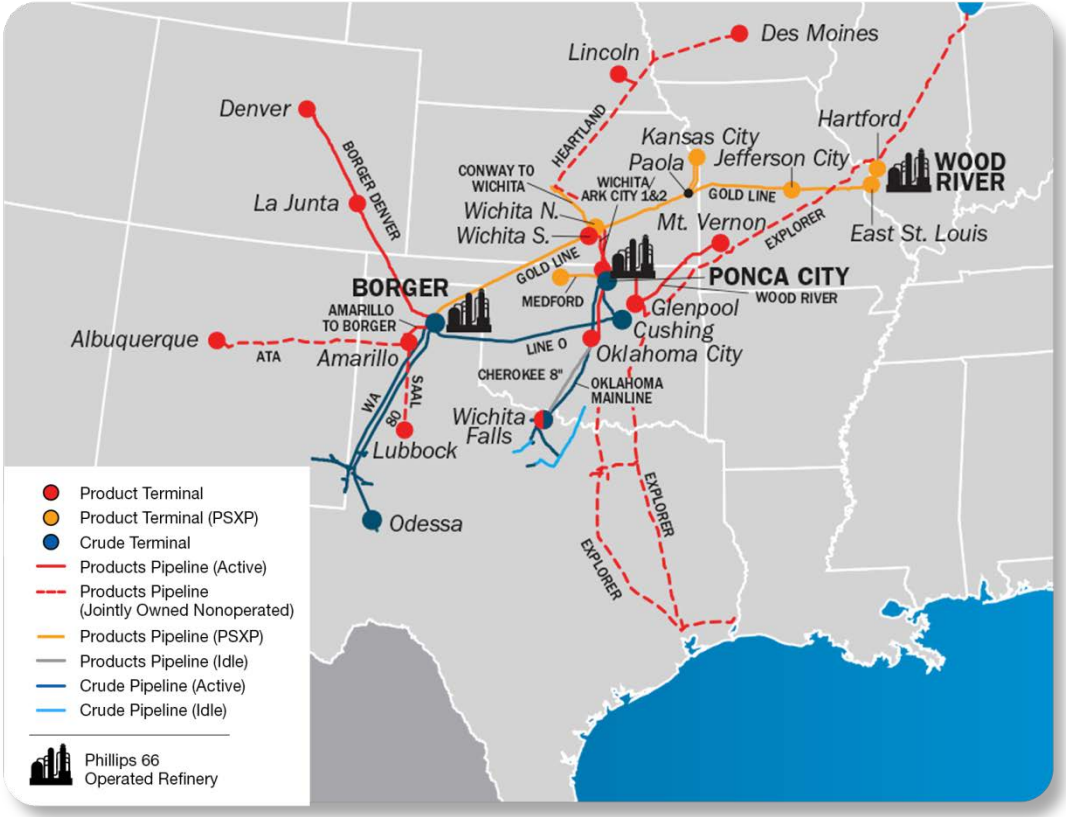
See appendix for footnotes.

NGL – Gulf Coast

- Sweeny Fractionator One – 100 MBD
- Storage caverns – 8 MMBbls
- LPG export terminal – 150 MBD
- Mont Belvieu pipeline – 200 MBD
- Sweeny Fractionator Two – 110 MBD

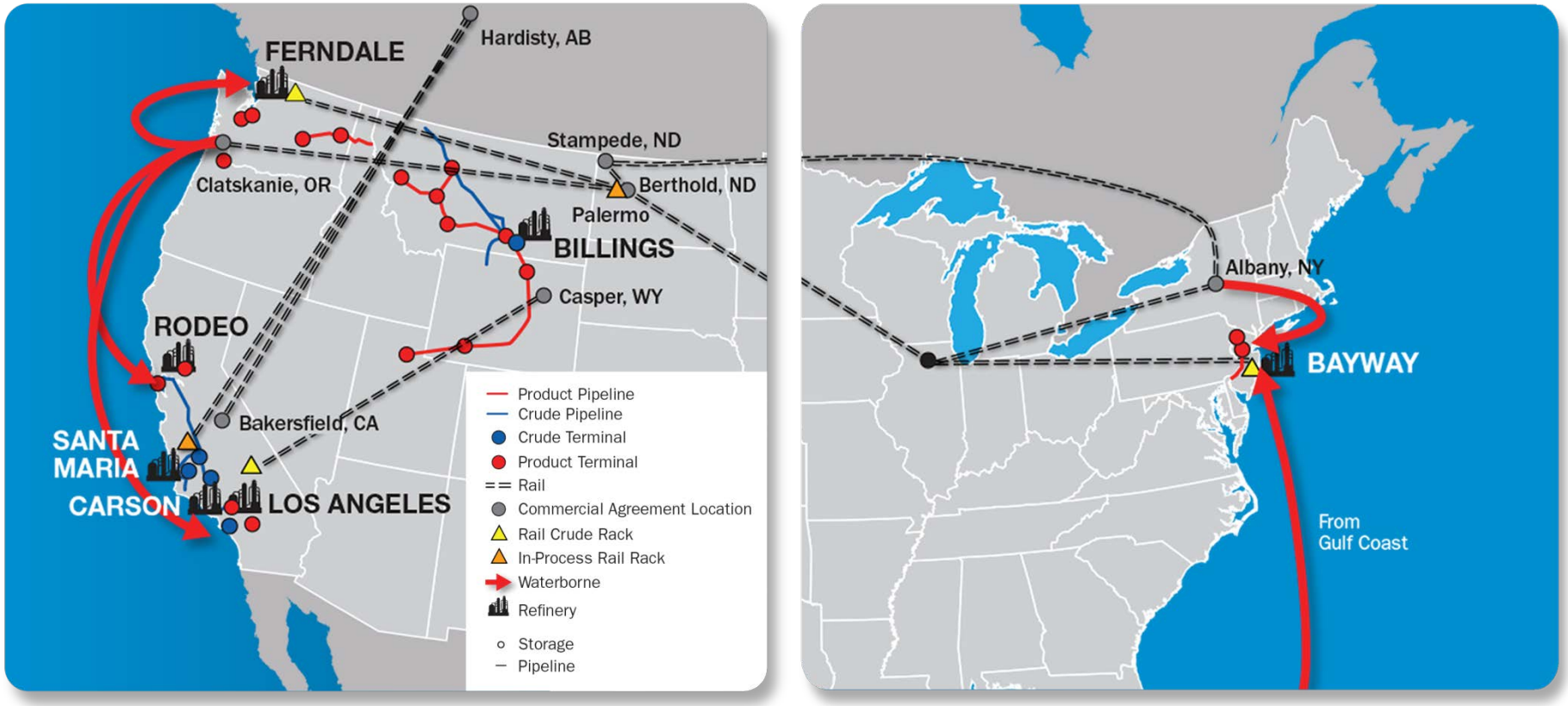


Transportation – Midcontinent

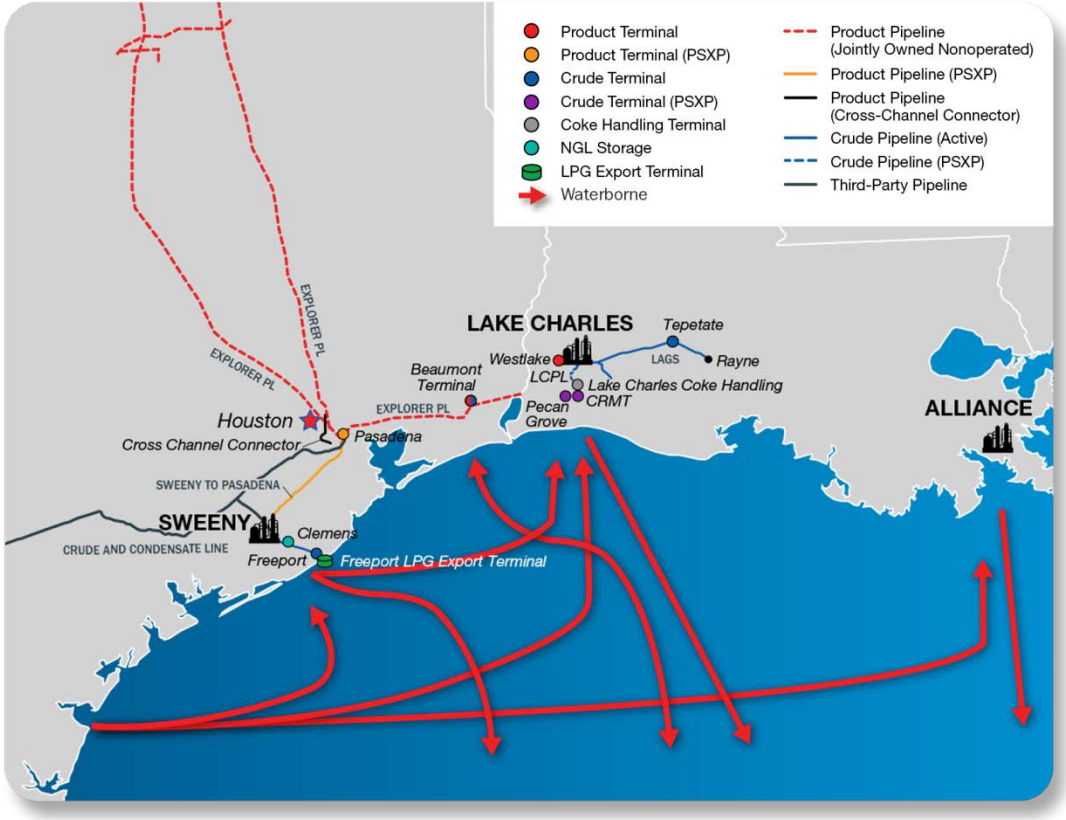


- 3,600+ miles of pipeline
- Over 20 crude and products terminals
- Crude gathering infrastructure
- Increased ownership in Explorer Pipeline

Transportation – West and East Coast



Transportation – Gulf Coast



- Beaumont Terminal optionality
- Integration with Refining
- Access to Eagle Ford and Permian Basin
- Increase export capability

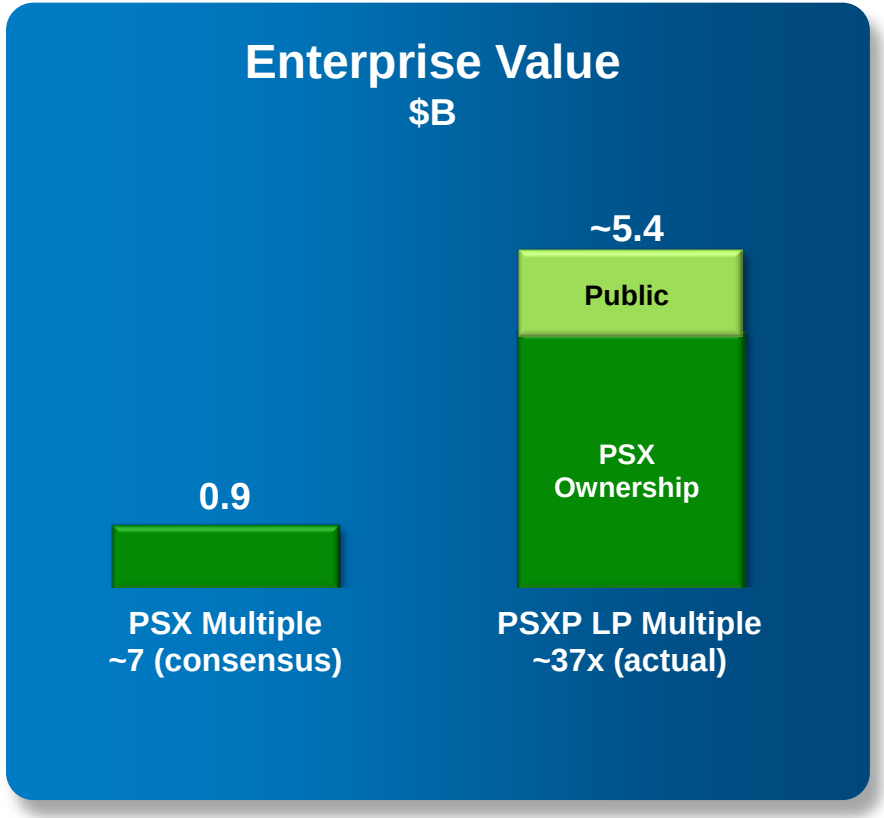
Phillips 66 Partners

Increases PSX value

PSX sponsorship provides:

- Strong portfolio of existing assets
- Pipeline of organic growth

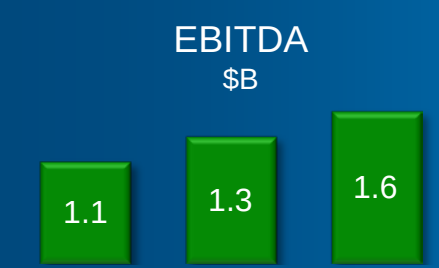
Low cost of capital



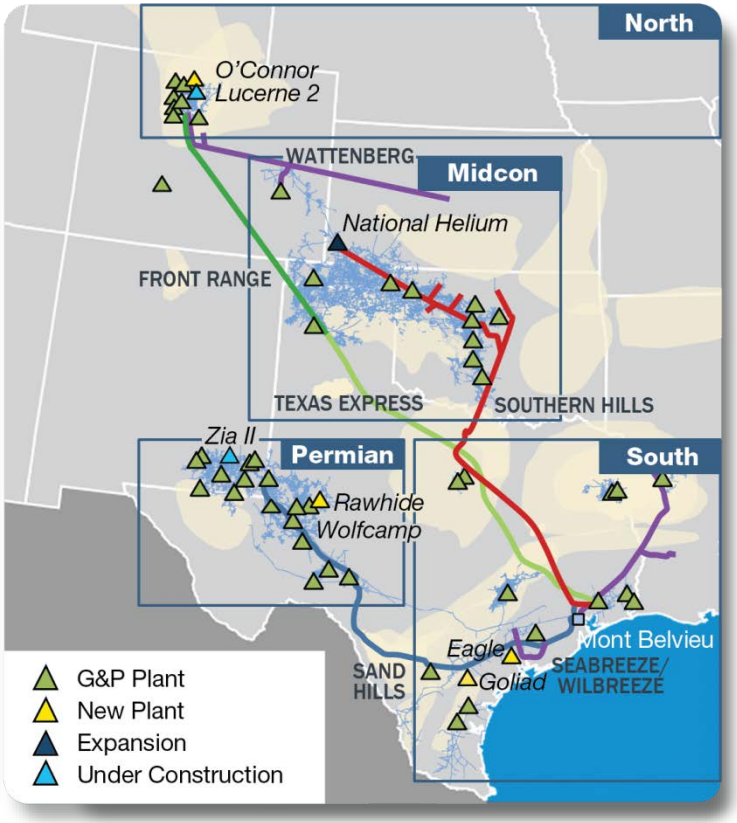
See appendix for footnotes.

DCP Midstream

	2013 NGL Production MBD	Processing Capacity BCFD	Capex 2014E-2016E $B
Permian	~130	1.4	1.0 - 1.5
South	~130	3.2	.50 - 1.0
North	~ 40	0.9	1.0 - 1.5
Midcon	~120	2.0	.75 - 1.0
Logistics	N/A	N/A	.75 - 1.0

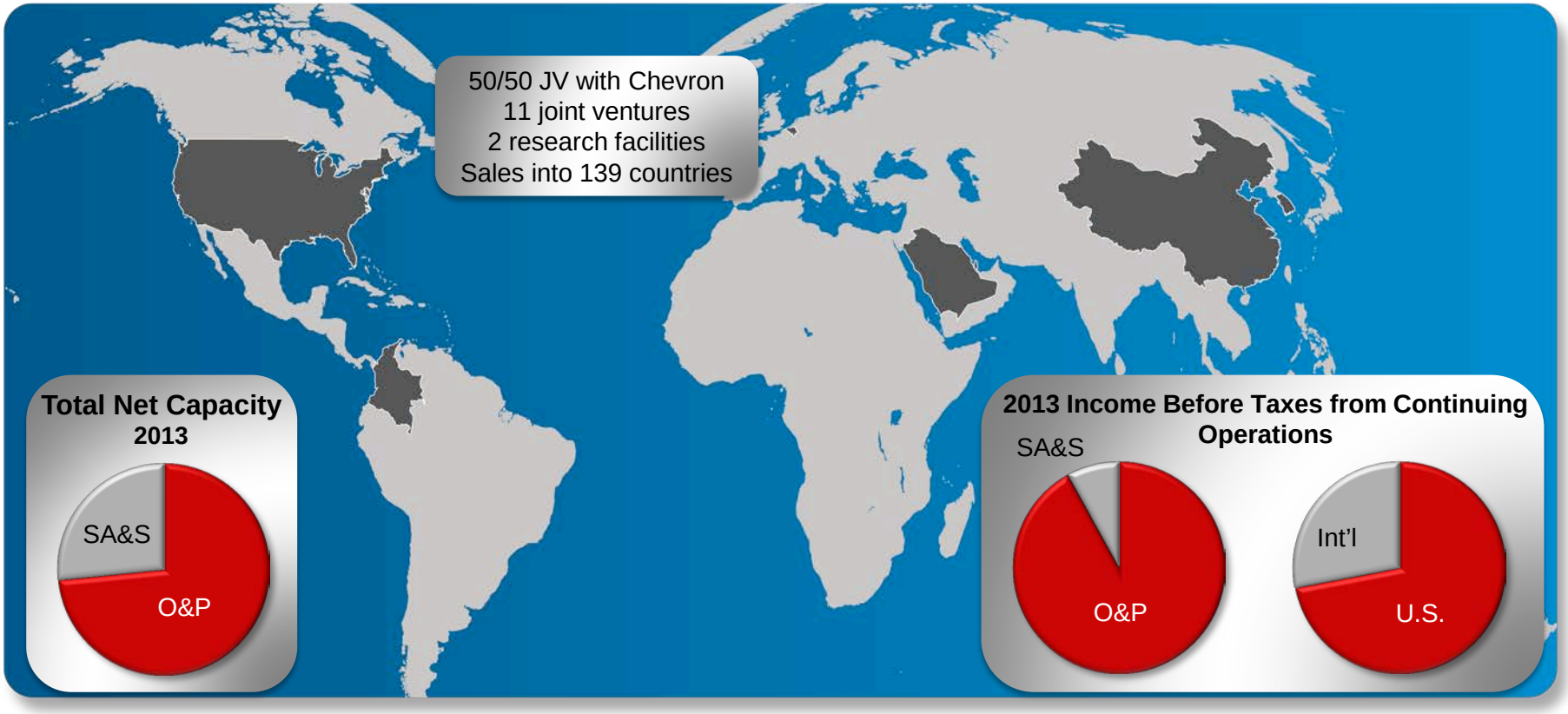




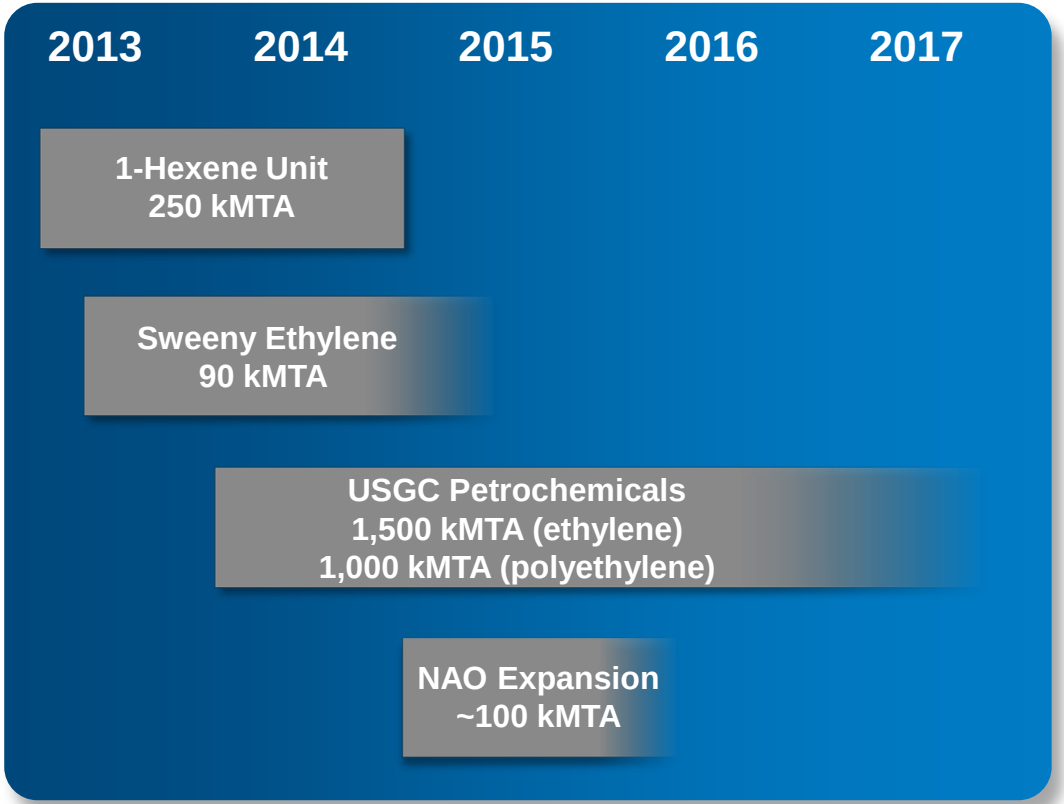


EBITDA chart reflects 100% DCP Midstream. See appendix for additional footnotes.

Chemicals – CPChem Portfolio



Chemicals – CPChem Growth Plans



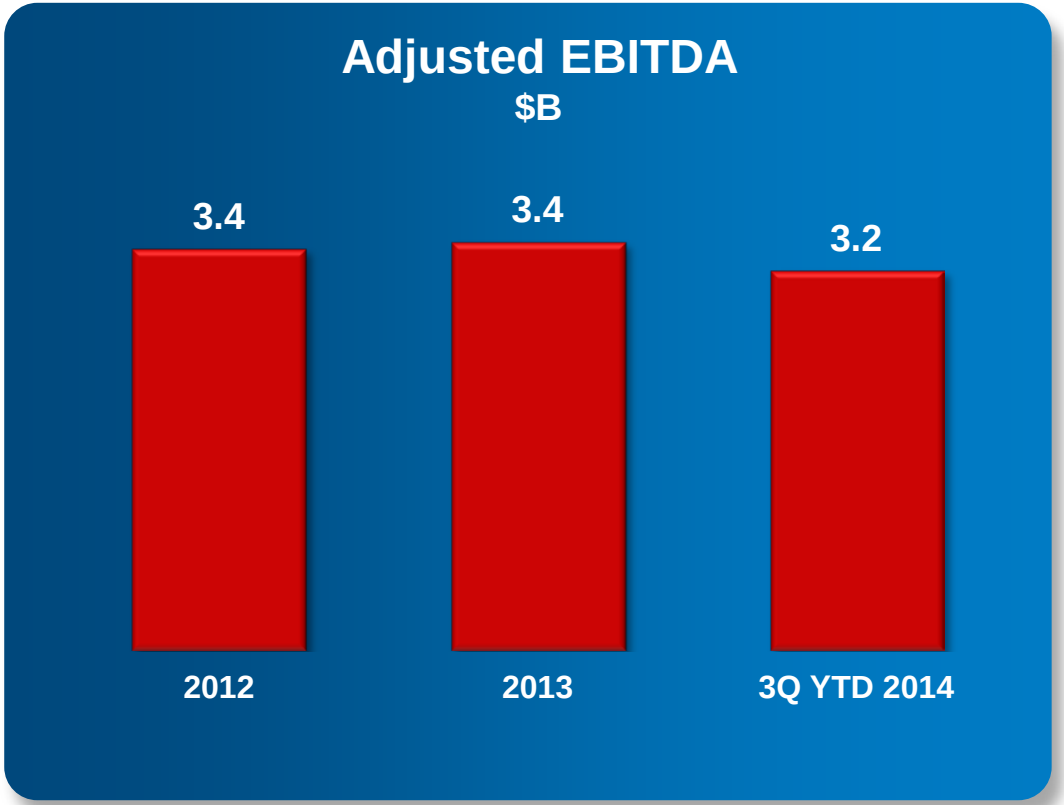
Self-funded capital program

$6.5 – 7 B growth spending

36% U.S. O&P capacity growth

Figures are 100% CPChem. See appendix for additional footnotes.

Chemicals – CPChem



Leading returns

Market leader

- Largest global HDPE producer
- 2nd largest global alpha olefins producer
- 4th largest N.A. ethylene producer

Estimated new project EBITDA

- $1.3 – 1.6 B/year 2017+

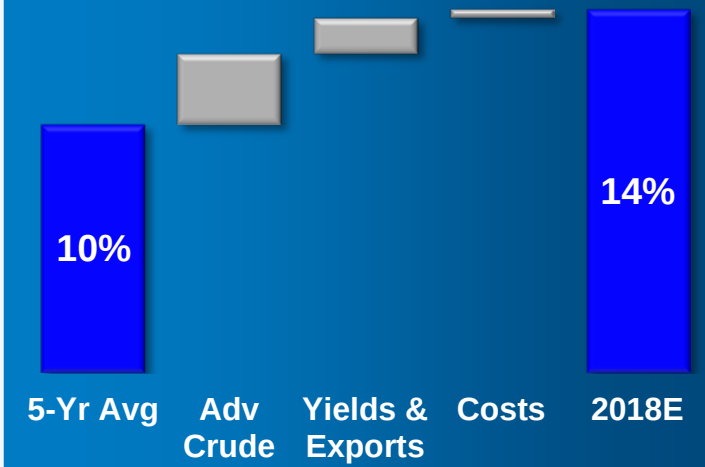
Figures reflect 100% CPChem.

Refining

15 refineries worldwide – 2.2 MMBD crude capacity



ROCE Improvement Constant Crack Spreads



See appendix for footnotes.

Marketing and Specialties

U.S. Marketing

Ensures Refining pull-through

International Marketing

Retail in Europe

Specialties

Finished lubricants

Base oil joint venture

Needle and anode coke

Adjusted EBITDA
2009 – 2014 Q3 YTD



Disciplined Capital Allocation

Investment

- Sustain operations
- Fund capacity growth
- Generate competitive returns

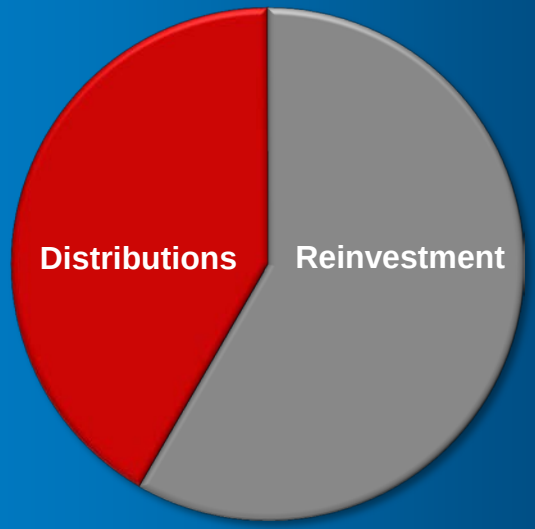
Distributions

- Double-digit dividend growth rate
- Repurchase shares

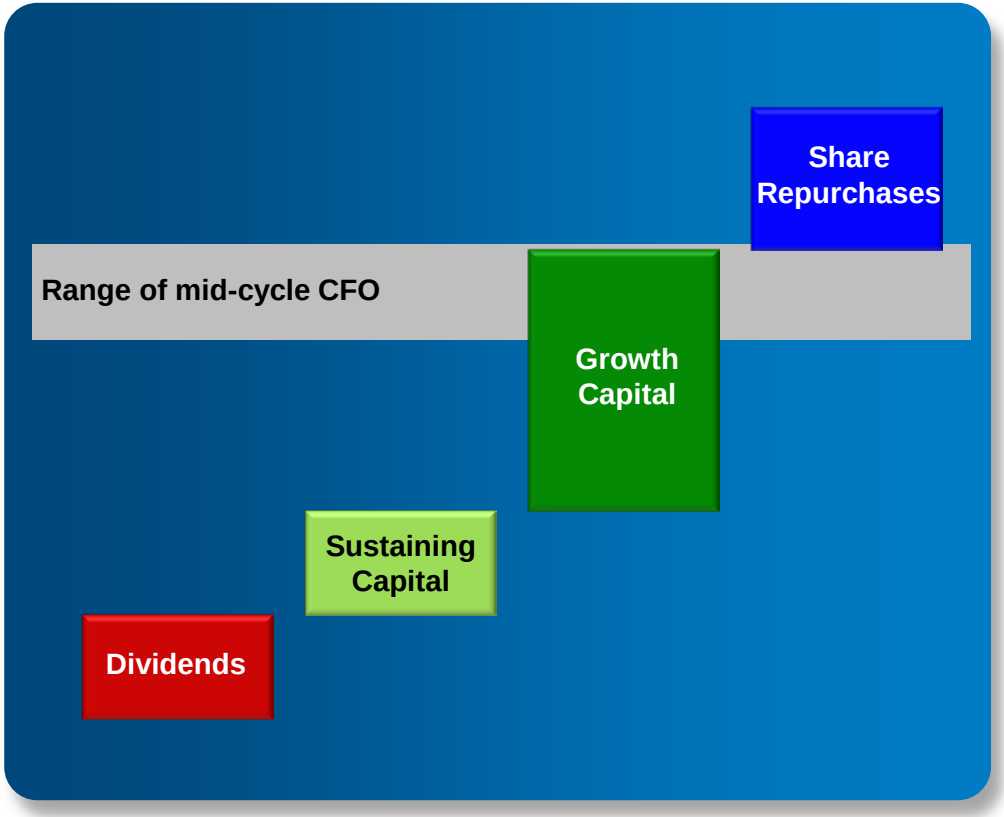
Capital Structure

- Maintain financial flexibility
- Target debt-to-capital 20 – 30%

2014E – 2016E



Capacity to Execute

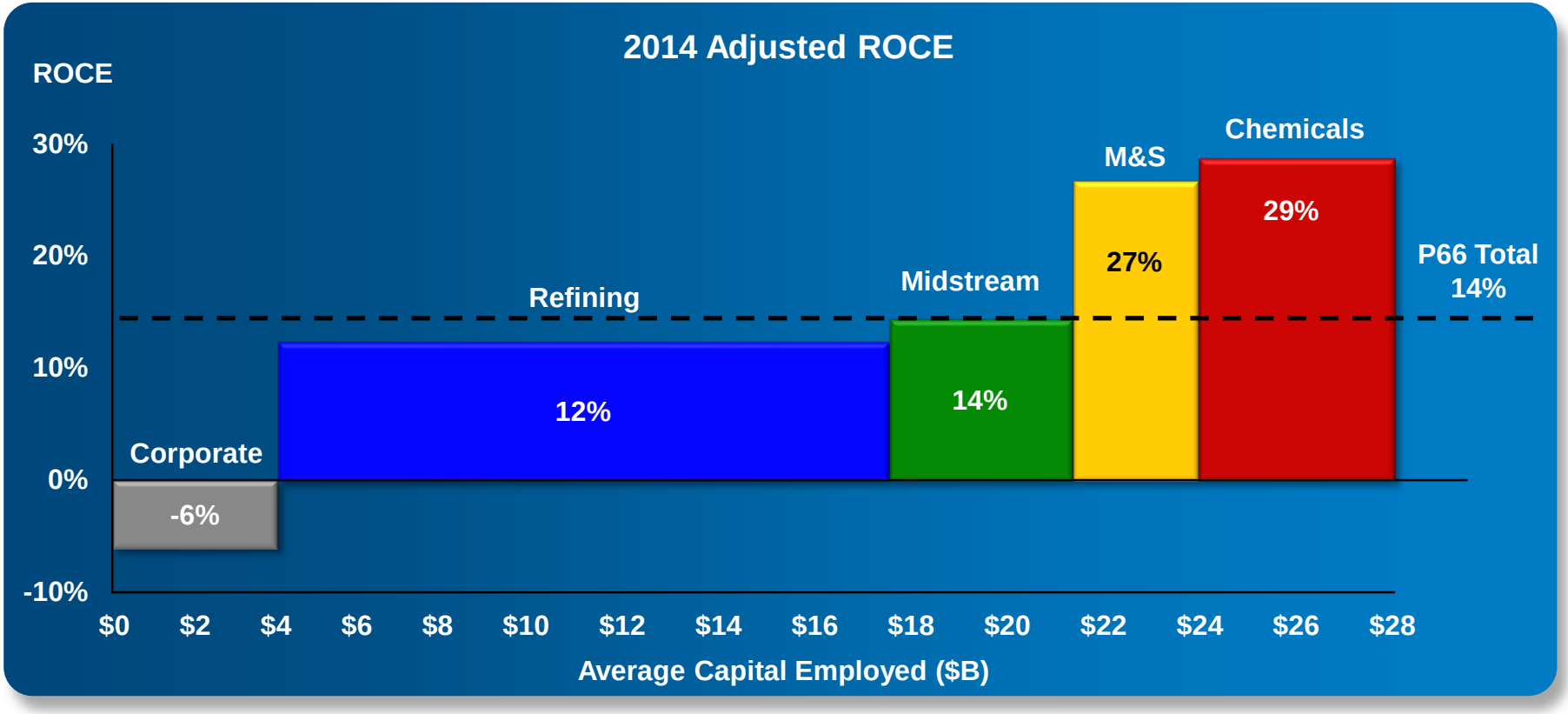


Additional Sources:

- Cash on hand
- Debt capacity
- MLP drop-downs
- Asset sales
- New project cash flows

See appendix for footnotes

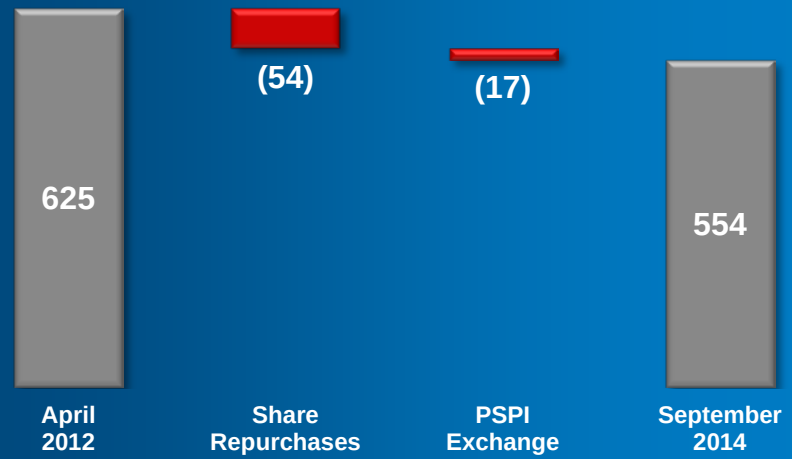
Returns



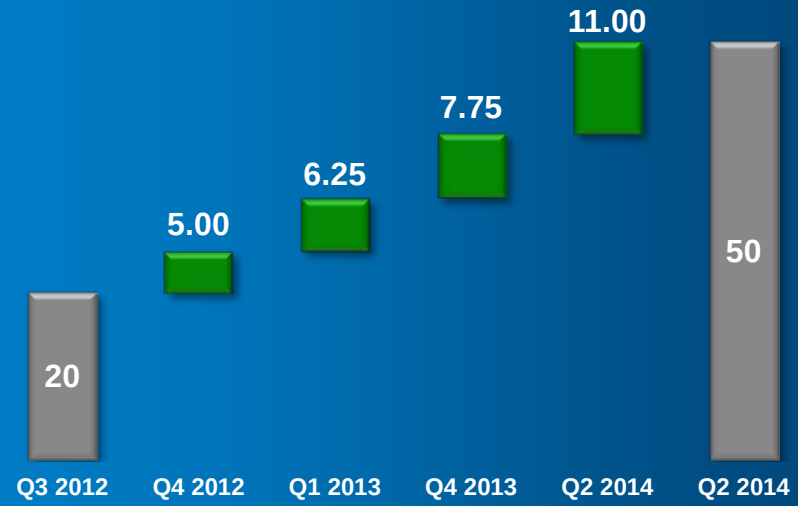
See appendix for footnotes.

Distributions

Phillips 66 Common Stock
MM shares



Dividend Growth
¢/share



150% growth vs. 69% peer average

See appendix for footnotes.

Delivering on Commitments

Growth

- $4.2 B 2014E growth capital program
- Beaumont Terminal and Spectrum acquisitions
- Grow Phillips 66 Partners

Returns

- 95% advantaged crude slate in 3Q 2014
- Record export volumes

Distributions

- 28% dividend increase
- $2 B additional share repurchases



See appendix for footnotes.

Compelling Investment

- Shareholder returns
- Unique portfolio
- EBITDA growth
- Disciplined capital allocation
- Multiple expansion



See appendix for footnotes.

Appendix



Institutional Investors Contact

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Footnotes

Slide 4

Injury statistics do not include major projects.

Industry Averages are from: Phillips 66 – American Fuel & Petrochemical Manufacturers (AFPM) refining data, CPChem – American Chemistry Council (ACC), DCP – Gas Processors Association (GPA).

Slide 7

“Sustaining” capital shown in chart includes Phillips 66 share only. Proportionate share of JV sustaining is included in the respective sections for DCP, CPChem and WRB, each of which is expected to be self-funding. 70% of capital program invested in growth based on 2014E – 2016E.

Slide 8

Refining logistics earnings are reported in Refining segment.

Slide 13

Phillips 66 ownership consists of ~75% of the total LP and GP units; Phillips 66 multiple of ~7x is based on consensus; Phillips 66 Partners multiple is based on actuals as of October 31, 2014.

Slide 14

EBITDA assumes commodity-neutral growth and includes noncontrolling interests.

Slide 16

Capital expenditures are estimates.

Slide 18

The 5-year average adjusted ROCE has been recast to reflect realignment of specific businesses moved from the Refining segment to the Marketing and Specialties segment.

Footnotes

Slide 21

Mid-cycle cash from operations is estimated based on a 10-year history normalized for Phillips 66's current operations and structure.

Slide 22

Data reflects 3Q 2014 YTD Annualized Adjusted Return on Capital Employed (ROCE).

Slide 23

Peer average includes DOW, MPC, TSO and VLO.

Slide 24

$4.2 B 2014E growth capital program includes proportionate share of JV growth capital.

Slide 25

Chart reflects total shareholder return May 1, 2012 to October 31, 2014. Phillips 66 dividends assumed to be reinvested in stock on payment date.

2014 Sensitivities

	Net Income $MM
Midstream	
1¢/Gal Increase in NGL price	4
10¢/MMBtu Increase in Natural Gas price	2
$1/BBL Increase in WTI price	2
Chemicals	
1¢/Lb Increase in Olefins Chain Margin (Ethylene, Polyethylene, NAO)	35
Worldwide Refining (assuming 94% refining utilization)	
$1/BBL Increase in Refining Margin	440
Impacts due to Actual Crude Feedstock Differing from Feedstock Assumed in Market Indicators:	
$1/BBL Widening LLS / Maya Differential (LLS less Maya)	50
$1/BBL Widening WTI / WCS Differential (WTI less WCS)	40
$1/BBL Widening WTI / WTS Differential (WTI less WTS)	15
$1/BBL Widening LLS / WCS Differential (LLS less WCS)	10
$1/BBL Widening ANS / WCS Differential (ANS less WCS)	10
$0.10/MMBtu Increase in Natural Gas price	(10)

Sensitivities shown above are independent and are only valid within a limited price range.

Capital Program

	Millions of Dollars		
	2014 Budget		
	Growth	Sustaining	Total
Capital Expenditures and Investments*			
Consolidated			
Midstream			
Transportation	806	150	956
NGL	1,262	5	1,267
	2,068	155	2,223
Chemicals	-	-	-
Refining	264	751	1,015
Marketing and Specialties	413	74	487
Corporate	15	116	131
	2,760	1,096	3,856
Selected Equity Affiliates			
DCP	600	150	750
CPChem	852	194	1,046
WRB	28	117	145
	1,480	461	1,941
Capital Program**			
Midstream			
Transportation	806	150	956
DCP	600	150	750
NGL	1,262	5	1,267
	2,668	305	2,973
Chemicals	852	194	1,046
Refining	292	868	1,160
Marketing and Specialties	413	74	487
Corporate	15	116	131
	4,240	1,557	5,797

**Includes non-cash capitalized leases and interest.*

***Includes Phillips 66's share of capital spending by DCP, CPChem and WRB, which are expected to be self-funded.*

Non-GAAP Reconciliations

	Millions of Dollars
Year Ended December 31	2013
Transportation and NGL	
Net income attributable to Phillips 66	$ 259
Plus:	
Net income attributable to noncontrolling interests	17
Income taxes	142
Depreciation and amortization	88
EBITDA*	$ 506

**Includes noncontrolling interests.*

Refining logistics, NGL growth and Transportation growth forecasts were derived on an EBITDA-only basis. Accordingly, elements of net income including tax and depreciation information are not available. Together, these items generally result in a significant uplift in EBITDA over net income.

Non-GAAP Reconciliations

	Millions of Dollars	
	First Year	
Sweeny Fractionator One and Two, and Freeport Export Facility		
Estimated net income	$	370
Plus:		
Estimated income taxes		230
Estimated net interest expense		10
Estimated depreciation and amortization		190
Estimated EBITDA	$	800

Non-GAAP Reconciliations

	Millions of Dollars
Years Ended December 31	2014E
Phillips 66 Partners LP	
Net income	$ 119.0 - 124.0
Plus:	
Depreciation	15.0
Net interest expense	5.4
Amortization of deferred rentals	0.4
Provision for income taxes	0.4
EBITDA	$ 140.2 - 145.2

Non-GAAP Reconciliations

Years Ended December 31		Millions of Dollars 2012	2014E	2016E
100% DCP Midstream				
Net income attributable to members' interest	$	486	510	555
Plus:				
Net income attributable to noncontrolling interests		97	135	255
Income taxes		2	10	10
Net interest expense		193	315	345
Depreciation and amortization		291	360	430
EBITDA*	$	1,069	1,330	1,595

**Includes noncontrolling interests.*

Non-GAAP Reconciliations

		Millions of Dollars		
		2012	2013	3Q YTD 2014
100% CPChem				
Net income	$	2,403	2,743	2,492
Plus:				
Income taxes		67	71	71
Net interest expense		8	(3)	(2)
Depreciation and amortization		356	278	212
EBITDA	$	2,834	3,089	2,773
Adjustments (pre-tax):				
Proportional share of equity affiliates income taxes		91	115	109
Proportional share of equity affiliates net interest expense		17	24	14
Proportional share of equity affiliates depreciation and amortization		157	214	163
Premium on early debt retirement		287	-	-
Impairments		-	-	175
Adjusted EBITDA	$	3,386	3,442	3,234

Non-GAAP Reconciliations

		Millions of Dollars	
		Low	High
100% CPChem Incremental Project Earnings Projections			
Estimated incremental net income	$	1,000	1,313
Plus:			
Estimated income taxes		20	27
Estimated net interest expense		-	-
Estimated depreciation		280	260
Estimated EBITDA	$	1,300	1,600

Non-GAAP Reconciliations

	Millions of Dollars	
		Average 2009 - 2013
Refining - ROCE		
Numerator		
Average 2009 - 2013 net income	$	998
After-tax interest expense		-
GAAP ROCE earnings		998
Special Items		452
Adjusted ROCE earnings	$	1,450
Denominator		
GAAP average capital employed*	$	13,940
Adjusted ROCE *(percent)*		10%
GAAP ROCE *(percent)*		7%

**2013 average total equity plus debt.*

Non-GAAP Reconciliations

	Millions of Dollars January 1, 2009 - September 30, 2014		
	U.S. Marketing	International Marketing	Specialties
Net income	$ 1,518	1,226	1,249
Plus:			
Provision for income taxes	954	590	750
Net interest expense	(119)	-	3
Depreciation and amortization	149	548	45
EBITDA	$ 2,502	2,364	2,047
Adjustments (pretax):			
Gain on asset dispositions	(260)	(106)	(83)
Pending claims and settlements	(19)	-	-
Impairments	71	-	-
Exit of a business line	-	-	54
Tax law impacts	(6)	-	-
Adjusted EBITDA	$ 2,288	2,258	2,018

Non-GAAP Reconciliations

		Millions of Dollars					
		Nine Months Ended September 30, 2014					
		Phillips 66	Midstream	Chemicals	Refining	Marketing & Specialties	Corporate
ROCE							
Numerator							
Net Income	$	3,639	435	870	1,254	667	(293)
After-tax interest expense		126	-	-	-	-	126
GAAP ROCE earnings		3,765	435	870	1,254	667	(167)
Special Items		(746)	-	69	-	(109)	-
Adjusted ROCE earnings	$	3,019	435	939	1,254	558	(167)
Denominator							
GAAP average capital employed*	$	28,477	4,052	4,358	13,520	2,788	3,663
Discontinued Operations		(96)	-	-	-	-	-
Adjusted average capital employed*	$	28,381	4,052	4,358	13,520	2,788	3,663
Annualized Adjusted ROCE *(percent)*		14%	14%	29%	12%	27%	-6%
Annualized GAAP ROCE *(percent)*		18%	14%	27%	12%	32%	-6%

**Total equity plus debt.*

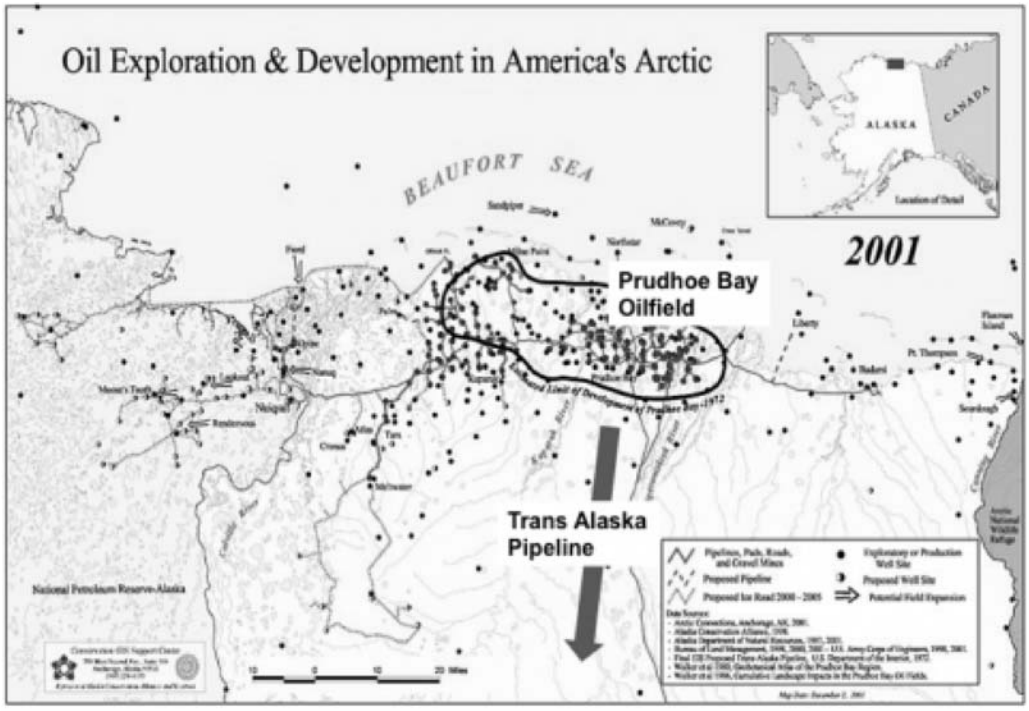
RBN Energy LLC

After the Oil Rush – ANS Decline and the West Coast Crude Market

Wednesday, 01/02/2013Published by: Sandy Fielden

Alaska North Slope (ANS) crude production has been in decline since 1987. Once producing over 2 MMb/d this prolific field averaged just 520 Mb/d in 2012. At the same time refiners on the West Coast who previously relied on ANS are beginning to get access to domestic shale crude and might be consuming Canadian crude exports from British Columbia in a few years' time. Today we explain the impact on West Coast crude pricing.

Alaska North Slope (ANS) crude is produced from the Prudhoe Bay field on the northern coast of Alaska beside the Beaufort Sea (see map below). The field was discovered in 1968 by ARCO (Atlantic Richfield now part of BP) and Humble Oil and Refining Company (now part of ExxonMobil). Production started in 1977 after the Mid-East Oil Crisis raised crude prices enough to justify construction of an $8B pipeline from Prudhoe Bay to Valdez marine terminal.



(http://www.rbnenergy.com/sites/default/files/styles/colorbox-full-screen/public/field/image/map_2.png)

(Click to Enlarge)

ANS is considered medium sour crude with an API gravity of 31.5 and 0.96 percent sulfur content. The chart below shows Alaskan crude production since 1977. After rising to a peak of over 2 MMb/d in 1987 production has been in decline since then. Average daily production through October of 2012 according to the Energy Information Administration (EIA) was 520 Mb/d. The largest ANS producers are ExxonMobil, ConocoPhillips and BP. There are still large recoverable crude reserves in Alaska but they will require significant investment to exploit and transport to market. Changes in the US crude supply position have made that new investment in Alaska less economically attractive. Prudhoe Bay also produces significant quantities of natural gas (8 Bcf/d). The majority of this gas is re-injected to improve oil recovery. There has been considerable debate and planning about building a pipeline to bring natural gas from Alaska to the US but low gas prices in the US make such a proposal uneconomic at present. For now ANS hydrocarbon production looks set to continue to decline.

To access the remainder of *After the Oil Rush – ANS Decline and the West Coast Crude Market* you must be logged as a **RBN Backstage Pass™** subscriber.

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Phillips 66
2014 Fact Book

INVESTING
BUILDING
GROWING



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An electronic file of this Fact Book can be obtained by visiting *www.phillips66.com,* selecting the Investors tab and then Financial & Operating Information. The file is located in the Annual Reports section of that page.

COVER: Sweeny Refinery in Old Ocean, Texas.



Billings Refinery, Billings, Montana.

COMPANY OVERVIEW

Built on more than 130 years of experience, Phillips 66 is a growing energy manufacturing and logistics company with high-performing Midstream, Chemicals, Refining, and Marketing and Specialties businesses. This integrated portfolio enables Phillips 66 to capture opportunities in the changing energy landscape. Headquartered in Houston, the company has 13,500 employees who are committed to operating excellence and safety. Phillips 66 had $50 billion of assets as of Dec. 31, 2013. Phillips 66 stock trades on the New York Stock Exchange under the ticker symbol PSX.

Midstream

Our Midstream segment transports crude oil, refined products, natural gas and natural gas liquids (NGL). It also gathers, processes and markets natural gas and NGL to power businesses, heat homes and provide feedstock to the petrochemical industry. The segment consists of Phillips 66's NGL business; Phillips 66's Transportation business, including Phillips 66 Partners LP, our master limited partnership (MLP) formed in 2013; and DCP Midstream, LLC, our 50-50 joint venture with Spectra Energy Corp.



Refining

Our Refining segment transforms crude oil into petroleum products such as gasoline, diesel and aviation fuel. Phillips 66 is one of the largest refiners in the United States and worldwide, with 15 refineries and a net crude oil processing capacity of 2.2 million barrels per day (MMBD).



Chemicals

Chevron Phillips Chemical Company LLC (CPChem), our 50-50 joint venture with Chevron, manufactures and markets petrochemicals, polymers and plastics found in cars, electronics and other everyday goods. CPChem is North America's largest producer of high-density polyethylene and the fourth-largest North American ethylene producer. CPChem has a large global presence with 35 manufacturing sites and 33 billion pounds (BLb) of net annual processing capacity.



Marketing and Specialties

The Marketing and Specialties segment includes our global fuel marketing and lubricants businesses. Phillips 66's U.S. Marketing business markets fuels under the brands Phillips 66®, Conoco® and 76®. In Europe, we sell primarily under the JET® brand in the United Kingdom, Austria and Germany, and the Coop® brand in Switzerland. The company also markets lubricants in 65 countries, and has several other specialty businesses, including base oil, petroleum coke, waxes, solvents and polypropylene.



2013 ACCOMPLISHMENTS

- Continued to be a top performer in safety compared to peers and integrated majors.
- Returned more than $3 billion of capital to our shareholders.
- Successfully launched Phillips 66 Partners, an MLP, to own, develop and acquire primarily fee-based transportation and midstream assets.
- Increased our quarterly dividend by 25 percent on two separate occasions.
- Achieved a total shareholder return of 48 percent.
- Repaid $1 billion of debt, reducing our total debt to about $6 billion and our debt-to-capital ratio to 22 percent.
- Invested $2 billion in growth capital.

2014 KEY INITIATIVES

Growth

- Advance midstream infrastructure projects.
- Progress CPChem's U.S. Gulf Coast (USGC) Petrochemicals Project.
- Grow Phillips 66 Partners.

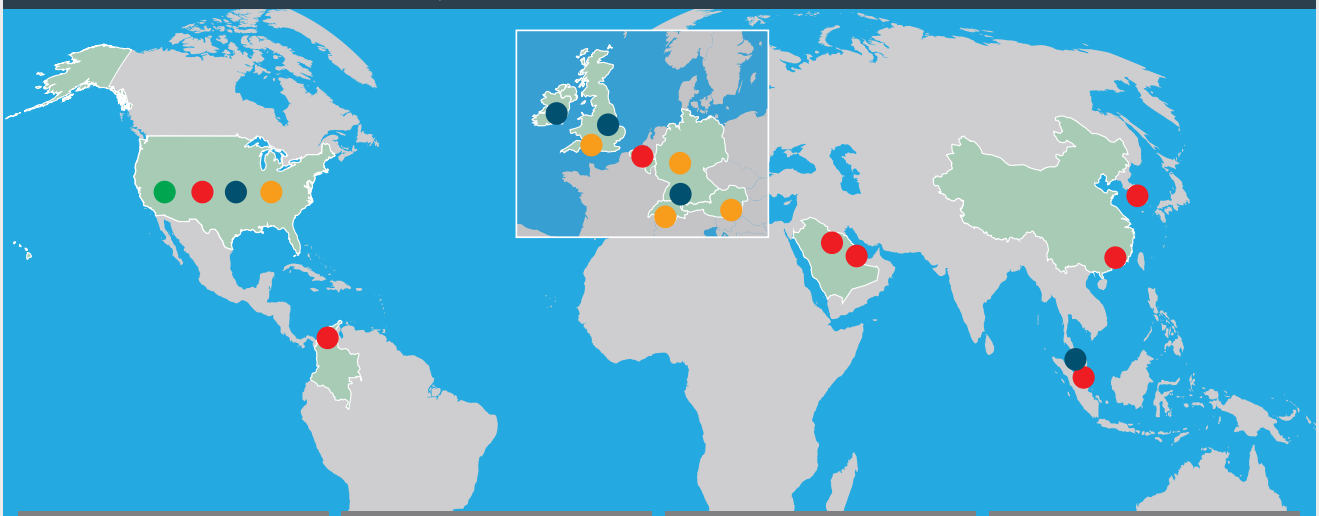
Enhance Returns

- Increase advantaged crude processing.
- Expand export capacity.
- Maintain cost discipline.

Grow Shareholder Distributions

- Annually grow dividend at double-digit rate through 2016.
- Continue share repurchase program.

WORLDWIDE OPERATIONS AS OF DEC. 31, 2013



MIDSTREAM
- 18,000+ pipeline miles
- 10,000+ railcars
- 115 MBD NGL fractionated
- 50-50 DCP joint venture

CHEMICALS
- 50-50 CPChem joint venture
- 35 manufacturing facilities
- 33 BLb/Y petrochemical and product capacity

REFINING
- 15 refineries
- 410 MBD export capacity
- 65% light-medium crudes
- 2.2 MMBD crude capacity

MARKETING & SPECIALTIES
- 10,000+ global outlets
- 2.2 MMBD marketing petroleum products sales
- 5 lubricant blending plants

COMPANY OVERVIEW

COMPETITIVE STRENGTHS

Robust Portfolio

As an energy manufacturing and logistics company that combines leading Midstream, Chemicals, Refining, and Marketing and Specialties businesses, Phillips 66 is uniquely positioned to capture opportunities of the changing energy landscape. Our businesses have the efficiency of scale and technical capability to compete in the most attractive markets globally.

Financial Strength

We hold an investment-grade credit rating on our long-term debt and maintain sufficient cash and liquidity enabling us to invest in high-return projects. Our approach to capital allocation is designed to fund sustaining investments and growth projects, while increasing shareholder distributions. As of Dec. 31, 2013, we had debt of $6.2 billion, a cash balance of $5.4 billion and a debt-to-capital ratio of 22 percent.



STRATEGIC PRIORITIES

Maintain Strong Operating Excellence

Our commitment to operating excellence guides everything we do, and it always will. Continuous improvement in safety, environmental stewardship, reliability and cost efficiency is a fundamental requirement for our company and employees. We employ rigorous training and audit programs to drive ongoing improvement in both personal and process safety as we strive for zero incidents. We are committed to protecting the environment and continually seek to reduce our environmental footprint throughout our operations.

Deliver Profitable Growth

Manufacturing and logistics capacity expansions in Midstream and Chemicals have the potential to deliver significant growth in earnings and cash flow. The businesses in our Midstream segment are pursuing multiple growth opportunities for additional fractionation and liquefied petroleum gas (LPG) export capacity, as well as gathering and processing, pipeline, storage and distribution infrastructure – driven by growing domestic unconventional crude oil, NGL and natural gas production. Over the next few years, CPChem plans to build additional processing capacity benefitting from lower-cost NGL feedstocks.

Enhance Returns on Capital

We intend to increase return on capital employed (ROCE) and capital efficiency in Refining through greater use of advantaged feedstocks, increasing refined product export capacity and increasing clean product and distillate yields from our refineries. By processing lower-cost crude oil and NGL feedstocks, our gross margins and ROCE have improved in Refining and Chemicals. We also expect to drive higher returns in Marketing and Specialties by selling finished products to higher-margin export markets. A disciplined and rigorous capital allocation process ensures that we focus investments in projects that generate competitive returns throughout the business cycle.

Grow Shareholder Distributions

We believe shareholder value is created through consistent and ongoing growth of regular dividends, supplemented by share repurchases. Regular dividends demonstrate the confidence we have in the company's capital structure and its capability to generate cash flow throughout the business cycle. The company has grown dividends



Sweeny Refinery, Old Ocean, Texas.

significantly in our first two years of operation. We plan, at the discretion of our board of directors, to increase dividends annually and fund a share repurchase program, while continuing to invest in the growth of our businesses. We expect to annually grow dividends at double-digit rates from 2014 through 2016.

Build a High-Performing Organization

Our success is primarily attributed to the contributions of our talented global workforce. We provide a great place to work where employees can reach their fullest potential, thrive on delivering results and create shareholder value through individual, team and organizational success. We foster an achievement-based culture that drives accountability and rewards performance, while investing in learning and development.

COMMERCIAL

Our Commercial organization manages the company's worldwide commodity portfolio. It partners with our Refining business to optimize our assets by procuring feedstocks with the highest economic value, minimizing laid-in cost and managing system inventory. The Commercial organization also partners with the Marketing business to ensure a dependable supply of products for wholesale customers while managing terminaling, throughput, exchange and other commercial agreements. This frees up both the Refining and Marketing and Specialties organizations to focus on operational performance. Commercial also identifies and executes location, time and quality arbitrage opportunities that generate attractive incremental returns.

In 2013, the Commercial organization was instrumental in sourcing lower-cost crude feedstocks for Phillips 66's U.S. refineries. Commercial negotiated several third-party agreements to procure and deliver more advantaged crudes to the company's facilities. As of Dec. 31, 2013, Commercial utilized 14 chartered, double-hulled crude oil and product tankers with capacities ranging in size from 300,000 to 1.1 million barrels that are primarily used to transport feedstocks to certain Phillips 66 U.S. refineries. Additionally, we have time charters on two medium-range Jones Act tankers to deliver shale crude to our Gulf and East Coast refineries.

MIDSTREAM



The 720-mile Sand Hills Pipeline began service in 2013.

Our Midstream segment consists of Phillips 66's NGL business; our Transportation business, including Phillips 66 Partners, our MLP formed in 2013; and our 50 percent interest in DCP Midstream.

MIDSTREAM OVERVIEW

OPERATING HIGHLIGHTS	2013	2012	2011
TRANSPORTATION			
Approximate miles of pipeline	18,000	18,000	17,000
Approximate number of railcars managed[1]	10,000	8,500	8,500
Crude terminals	14	10	5
Products terminals	39	39	42
Combined total recordable rate (safety incidents per 200,000 hours)	0.14	0.18	0.12
DCP MIDSTREAM (100%)			
Total natural gas throughput (TBTUD)	7.1	7.1	7.0
Midstream NGL produced (MBD)	426	402	383
Number of processing plants[2]	64	62	61
Number of NGL fractionators	12	12	12
Natural gas storage capacity (BCF)	15	9	9
Approximate miles of pipeline	67,000	63,000	62,000
Combined total recordable rate (safety incidents per 200,000 hours)	1.57	0.92	1.16
NGL			
NGL fractionated (MBD)	115	105	112

[1] Includes CPChem railcars that Phillips 66 manages.
[2] Three plants began operations and one was shut down in 2013.

2013 ACCOMPLISHMENTS

- Announced plans for the Sweeny Fractionator One and Freeport LPG Export Terminal.
- Launched an MLP through the successful initial public offering (IPO) of Phillips 66 Partners to own, develop and acquire primarily fee-based crude oil, refined petroleum products and NGL pipelines and terminals.
- Took delivery of 2,000 new crude oil railcars that meet or exceed current regulatory standards to deliver domestic advantaged crude oil to our U.S. refineries.
- Began construction on rail offloading facilities at the Bayway and Ferndale refineries.
- Began service on the 720-mile Sand Hills and 800-mile Southern Hills NGL pipelines.
- Conducted open season for the Cross-Channel Connector Pipeline, which was successfully completed in January 2014.
- DCP Midstream began commercial operations at three new gas processing plants in Colorado and Texas.

MIDSTREAM

NGL

Phillips 66 holds direct interests in three NGL fractionators and gathering systems at strategic NGL hubs in the United States. Phillips 66 owns 22.5 percent of the Gulf Coast Fractionators partnership in Mont Belvieu, Texas. The company also owns 12.5 percent of the Enterprise Mont Belvieu Fractionator and 40 percent of the Conway Fractionator, located at the Conway hub in Kansas.

In addition to fractionators, we own interests in several NGL gathering and interstate transmission pipeline systems. These systems gather and deliver raw or mixed NGL, also referred to as Y-Grade, to supply the company's facilities at its joint-venture Borger Refinery in Texas and the fractionators in Mont Belvieu and Conway.

Phillips 66 has supply and trading operations that manage NGL volume requirements for Phillips 66 refineries and fractionators. It also conducts trading at the Conway and Mont Belvieu hubs.

KEY PROJECTS

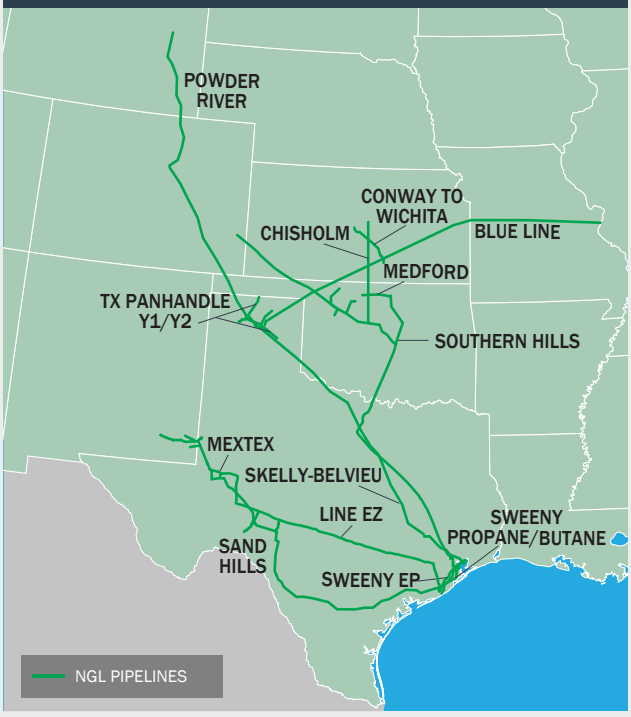
In 2013, Phillips 66 announced plans for two projects that we expect will significantly grow the value of our NGL business. The 100,000 barrel-per-day (BPD) Sweeny Fractionator One Project will be located close to our Sweeny Refinery in Old Ocean, Texas. NGL feedstock for the fractionator project will be supplied by several nearby pipelines, and products manufactured by the fractionator will be marketed to petrochemical customers in the region and exported globally.

Phillips 66 is also developing an LPG export facility at our existing marine terminal in Freeport, Texas. The new facility is intended to help meet growing global market demand for U.S.-supplied products and will leverage the company's transportation and storage infrastructure. With an expected 4.4 million barrels per month of LPG export capacity, the Freeport LPG Export Terminal will be supplied with LPG from the Mont Belvieu and Sweeny areas. A related sales contract for delivery of LPG to China was signed in March 2014.

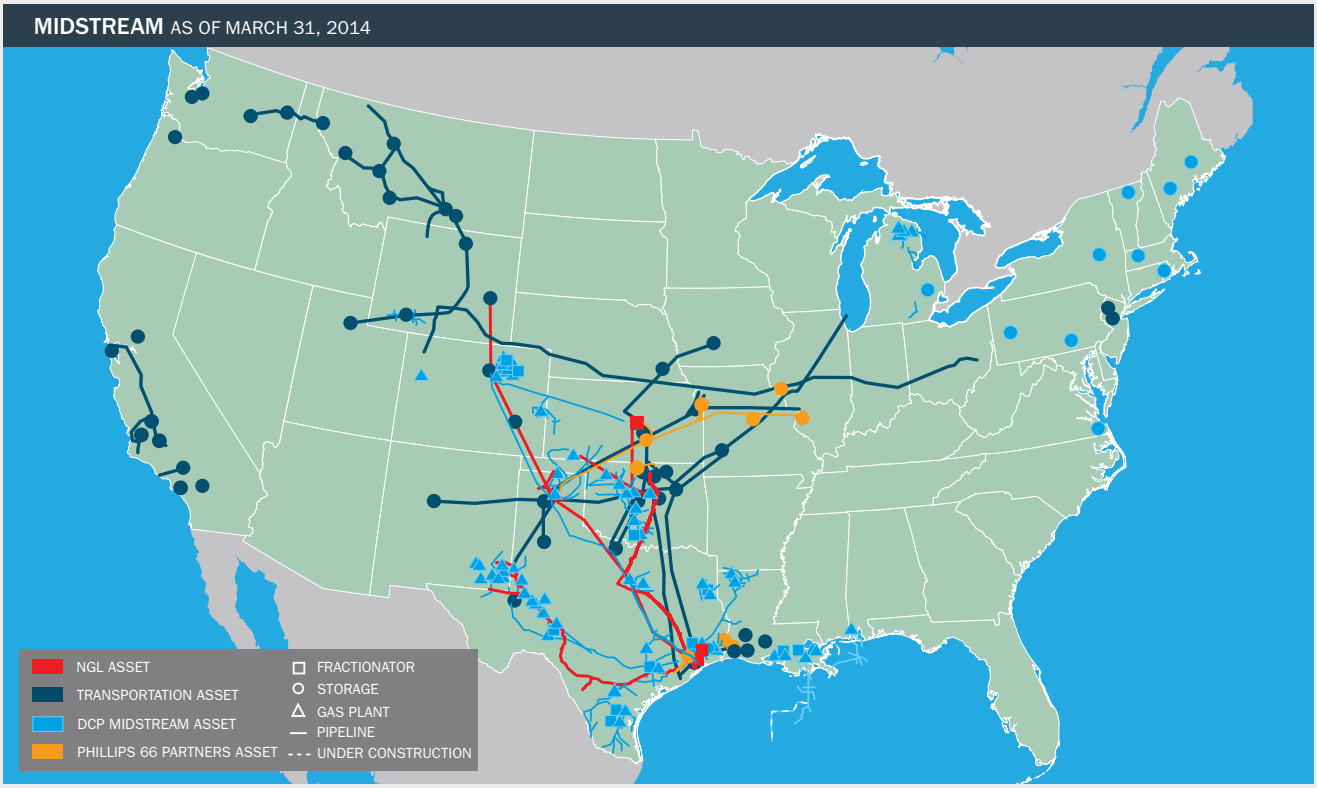
The fractionator is expected to start up in the third quarter of 2015, with the export facility following in mid-2016. These two projects, which received board approval in early 2014, represent a total investment of more than $3 billion.

Phillips 66 holds direct one-third ownership interests in the Sand Hills and Southern Hills NGL pipelines, connecting Eagle Ford shale, Permian Basin and Midcontinent NGL production to the Mont Belvieu market. DCP Midstream operates the pipelines, which began service in 2013.

NGL PIPELINES AS OF DEC. 31, 2013*



* Includes certain NGL pipelines owned by equity affiliates.



TRANSPORTATION

Phillips 66 owns or leases logistics assets to provide strategic, timely and environmentally safe delivery of crude oil, refined products, natural gas and NGL. These assets include pipeline systems; refined products, crude oil and LPG storage terminals; a petroleum coke-handling facility; marine vessels; railcars; and a trucking joint venture, Sentinel Transportation LLC.

KEY PROJECTS

Phillips 66 is investing hundreds of millions of dollars in Transportation assets to support the future success of its logistics customers, as well as Phillips 66 operations. Key among these investments is the planned acquisition of a terminal located near Beaumont, Texas. The Beaumont Terminal will be the largest terminal in the Phillips 66 portfolio and is strategically located on the U.S. Gulf Coast. It provides deep-water access and multiple interconnections with major crude oil and refined products pipelines serving 3.6 MMBD of refining capacity. The terminal also has 4.7 million barrels (MMBbl) of crude oil storage capacity and 2.4 MMBbl of refined products storage capacity; two marine docks capable of handling Aframax tankers and one barge dock; and rail and truck loading and offloading facilities. The acquisition is expected to close in the third quarter of 2014.

MIDSTREAM



Hartford Terminal, Hartford, Illinois.

The Cross-Channel Connector Pipeline, planned to be operational in the fourth quarter of 2014, will have an initial capacity for transport of up to 180,000 BPD of refined petroleum products from refineries and terminals on the south side of the Houston Ship Channel to third-party systems on the north side of the channel at Galena Park and East Houston. Additional pumping capability could bring the capacity up to 230,000 BPD.

Several notable pipeline expansions began in 2013, including pump station work on the Pioneer and Amarillo to Lubbock (SAAL) products pipeline systems. These projects were completed in early 2014. Transportation also completed projects in 2013 to increase capacity of the Powder River and Skelly-Belvieu pipelines in support of our growing NGL business in Texas.

Construction began on rail offloading facilities at the Bayway Refinery in New Jersey and the Ferndale Refinery in Washington, both of which are expected to be operational in the second half of 2014. The Bayway rail facility will have a capacity of 70,000 BPD, and the Ferndale rail facility will have a capacity of 30,000 BPD.

The company continued to add biodiesel and ethanol blending capability at its terminals in response to the Environmental Protection Agency's Renewable Fuel Standards program. Since 2012, the company has increased its overall renewable fuel blending capacity by 9 percent, including a 110 percent increase in biodiesel.

PIPELINES AND TERMINALS

As of March 31, 2014, Phillips 66 managed approximately 18,000 miles of crude oil, raw NGL, natural gas and refined products pipeline systems in the United States, including those partially owned or operated by affiliates. In addition, the company owned or operated 39 refined products terminals, 37 storage locations, five LPG terminals, 14 crude oil terminals and one petroleum coke exporting facility.

The Transportation Midcontinent Region includes nearly 3,700 miles of pipelines and more than 20 crude oil and refined products storage terminals.

MIDCONTINENT REGION AS OF MARCH 31, 2014



MIDCONTINENT REGION

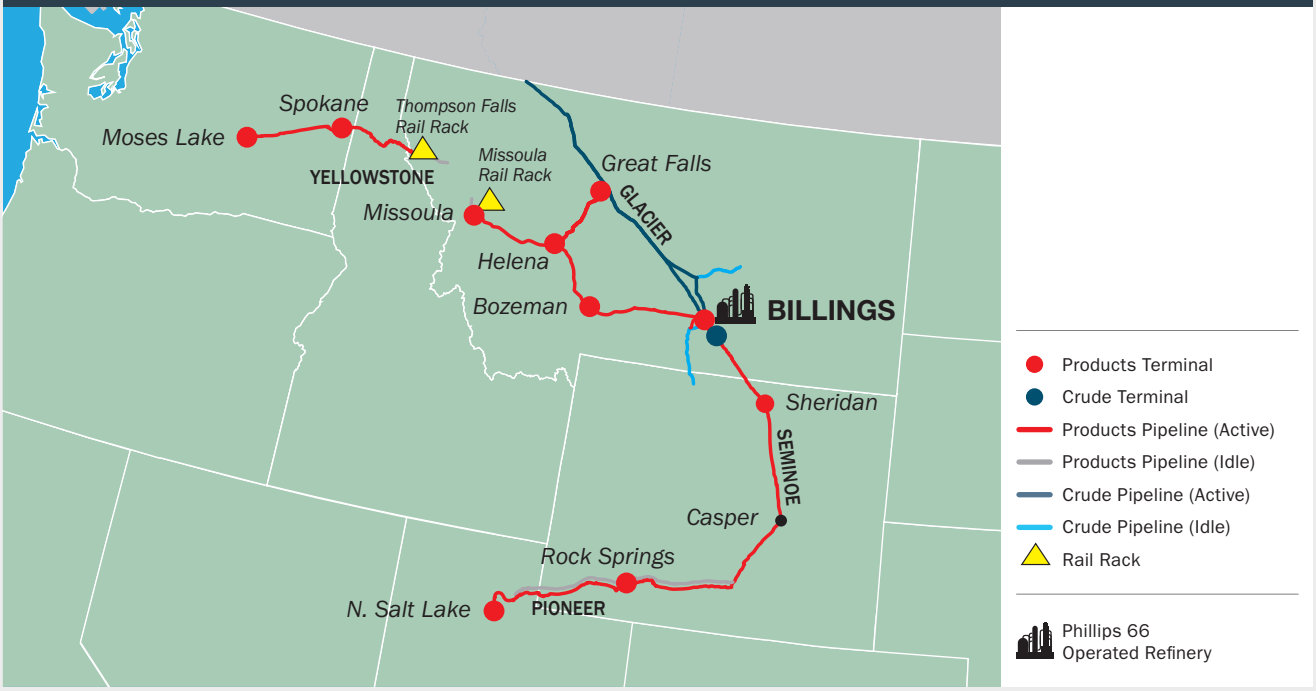
Phillips 66 has nearly 3,700 miles of pipelines and over 20 crude oil and refined products terminals in the Midcontinent Region. In addition, the company currently has a 19.5 percent interest in the Explorer Pipeline after acquiring an additional 5.7 percent interest in early 2014. Explorer is a 1,835-mile joint-interest product pipeline servicing both Midcontinent and Gulf Coast markets.

Using pipelines and trucks or the market centers in Midland, Texas, and Cushing, Oklahoma, our system delivers 100 percent of the Ponca City and Borger refineries' crude needs through local sources. The company is evaluating opportunities to increase connectivity of these assets to increase utilization, extend its reach into growing production areas and provide enhanced market access.

The company uses its extensive network of Phillips 66- and Phillips 66 Partners-owned pipelines and terminals, as well as connections to third-party systems, to distribute clean products to our large branded marketing business in the Midcontinent and Rockies regions.

MIDSTREAM

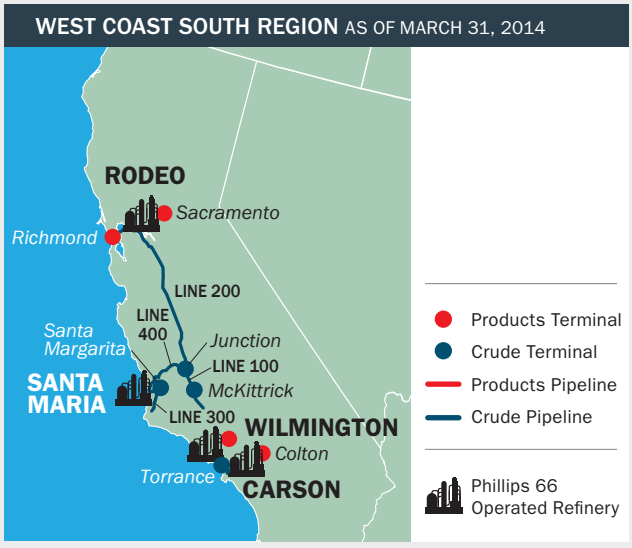
ROCKIES REGION AS OF MARCH 31, 2014

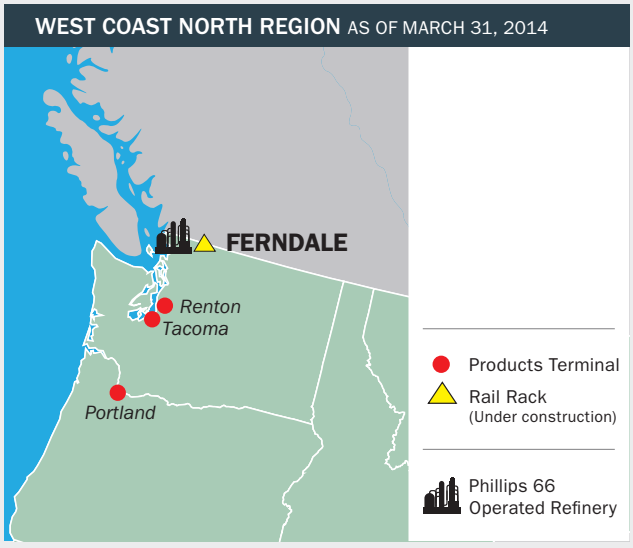


ROCKIES REGION

In the Rockies Region, the 865-mile Glacier Pipeline delivers Canadian crude oil to Phillips 66's Billings Refinery in Montana. The company ships clean products on approximately 1,600 miles of pipeline for placement into key branded markets in Montana, eastern Washington and Wyoming. There are 11 crude and products terminals in the system.

We recently expanded capacity on the Pioneer products system that serves Salt Lake City and accesses the UNEV Pipeline serving Las Vegas. Further projects are planned to serve growing demand in the region.





WEST COAST REGION

In California, Phillips 66 has more than 600 miles of crude pipelines that access locally produced California crudes and marine docks for waterborne crudes. We are adding additional tankage at our Los Angeles Refinery to increase access to advantaged waterborne crudes.

On the products side, the company's network in the region includes over 100 miles of pipelines and seven terminals to service its wholesale marketing business. The Wilmington truck rack has a capacity of 75,000 BPD.

A 30,000 BPD rail offloading facility under construction at the Ferndale Refinery is expected to be operational in the second half of 2014.

MIDSTREAM

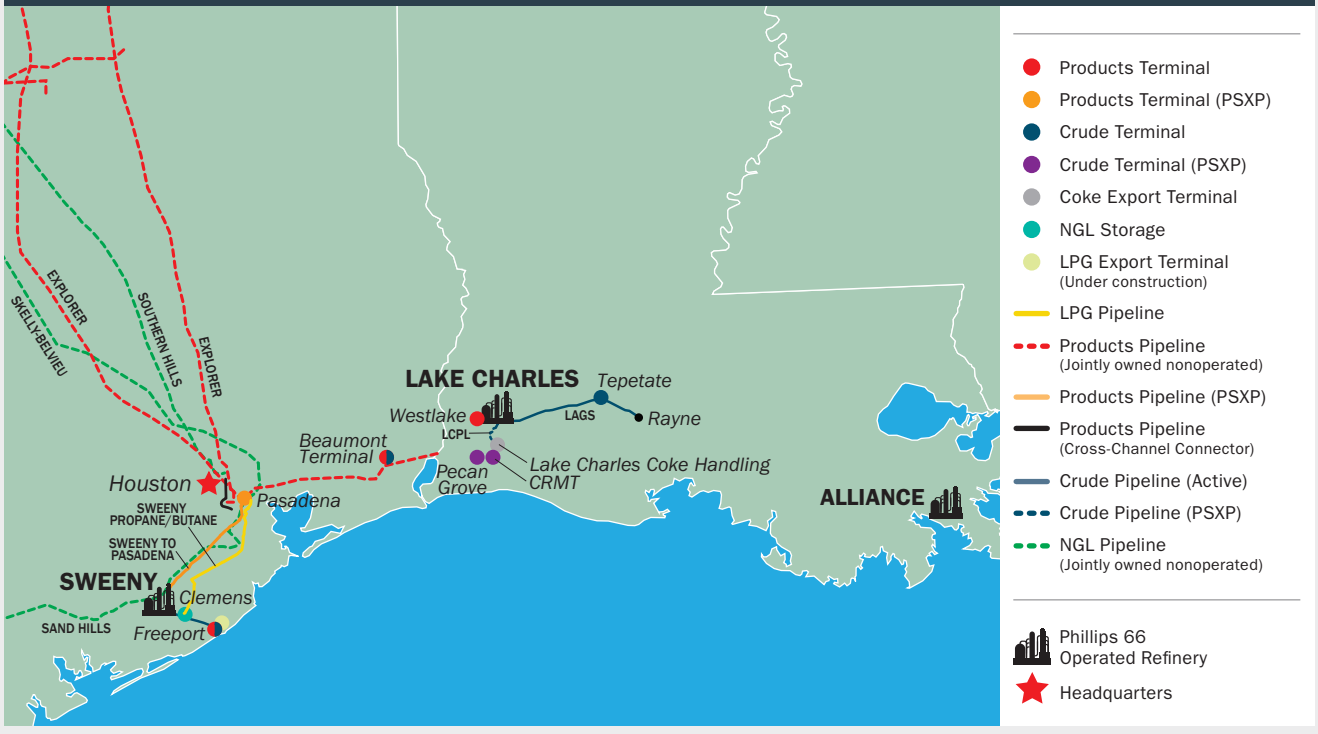
GULF COAST REGION

Phillips 66 owns and operates a number of shorter, high-capacity lines to support its 733,000 BPD of refining capacity and NGL operations on the Gulf Coast. The Gulf Coast Region contains about 300 miles of both Phillips 66- and Phillips 66 Partners-owned pipelines and six terminals.

In addition to the expanding NGL business, we are pursuing a number of projects in the region to provide our refineries and third parties access to growing U.S. and Canadian crude oil production.

The company is also increasing its product export capability in this region to meet the growing demand for motor fuels in regions outside the United States.

GULF COAST REGION AS OF MARCH 31, 2014*



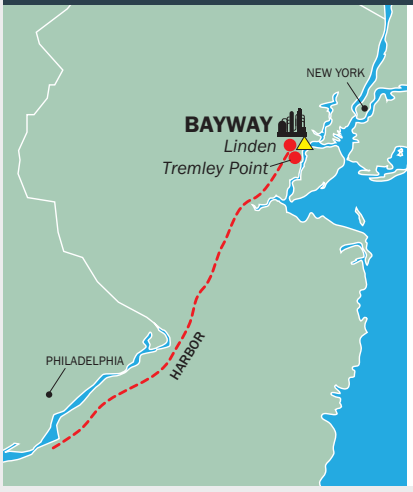
*Beaumont Terminal acquisition expected to close in the third quarter of 2014.

Phillips 66 took delivery of 2,000 new crude oil railcars in 2013, and has ordered another 1,200 crude oil railcars for delivery by the end of 2014.



Phillips 66 took delivery of 2,000 new crude oil railcars in 2013.

EAST COAST REGION AS OF MARCH 31, 2014



- Products Terminal
- Products Pipeline (Jointly owned nonoperated)
- Rail Rack (Under construction)
- Phillips 66 Operated Refinery

EAST COAST REGION

Phillips 66 operates two refined product terminals in New Jersey near our Bayway Refinery and has a 33 percent interest in a refined products pipeline in the region. A 70,000 BPD rail offloading facility, expected to start up in mid-2014, will enable the Bayway Refinery to receive advantaged crude oil deliveries by rail.

TRUCK AND RAIL

Phillips 66 manages truck and rail operations on behalf of its U.S. Refining and Specialties businesses. Rail movements are provided via a diverse fleet of more than 10,000 owned and leased railcars. In October 2012, we entered into an operating lease covering 2,000 new crude oil railcars that were delivered in 2013, and in early 2014, the company ordered an additional 1,200 crude oil railcars expected to be delivered by the end of 2014. These new crude railcars, which meet or exceed current government safety standards, are part of our program to increase the safe shipment of advantaged crudes into Phillips 66 refineries. Truck movements are provided through approximately 150 third-party trucking companies. In addition, a joint venture, Sentinel Transportation, provides dedicated and specialized trucking services for Phillips 66.

MIDSTREAM

MAJOR PIPELINE SYSTEMS *as of March 31, 2014*

NAME	ORIGINATION/TERMINUS	INTEREST (PERCENT)	SIZE	MILES	CAPACITY (MBD)
CRUDE AND FEEDSTOCKS					
Glacier	Cut Bank, MT/Billings, MT	79	8”-12”	865	100
Line 80	Gaines, TX/Borger, TX	100	8”, 12”	237	33
Line O	Cushing, OK/Borger, TX	100	10”	276	37
WA Line	Odessa, TX/Borger, TX	100	12”, 14”	289	118
Cushing	Cushing, OK/Ponca City, OK	100	18”	62	130
North Texas Crude	Wichita Falls, TX	100	2”-16”	339	28
Oklahoma Mainline	Wichita Falls, TX/Ponca City, OK	100	12”	217	100
Clifton Ridge [1] (PSXP)	Clifton Ridge, LA/Westlake, LA	75	20”	10	300
Louisiana Crude Gathering	Rayne, LA/Westlake, LA	100	4”-8”	85	25
Sweeny Crude	Sweeny, TX/Freeport, TX	100	12”, 24”, 30”	31	295
Sweeny Crude Butadiene [2]	Clemens, TX/Webster, TX	100	4”, 6”	68	7
Coast and Valley System	Central CA/Bay Area, CA	100	8”-16”	602	307
PETROLEUM PRODUCTS					
Harbor	Woodbury, NJ/Linden, NJ	33	16”	80	104
Pioneer [1]	Sinclair, WY/Salt Lake City, UT	50	8”, 12”	562	63
Seminoe	Billings, MT/Sinclair, WY	100	6”-10”	342	33
Yellowstone	Billings, MT/Moses Lake, WA	46	6”-10”	710	66
Borger to Amarillo	Borger, TX/Amarillo, TX	100	8”, 10”	93	76
ATA Line	Amarillo, TX/Albuquerque, NM	50	6”, 10”	293	20
Borger-Denver	McKee, TX/Denver, CO	70	6”-12”	405	38
Gold Line [1] (PSXP)	Borger, TX/East St. Louis, IL	75	8”-16”	681	120
SAAL	Amarillo, TX/Amarillo and Lubbock, TX	33	6”	121	18
Cherokee 8”	Ponca City, OK/Oklahoma City, OK	100	8”	90	46
Heartland [3]	McPherson, KS/Des Moines, IA	50	8”, 6”	49	30
Paola Products [1] (PSXP)	Paola, KS/Kansas City, KS	75	8”, 10”	106	96
Standish	Marland Junction, OK/Wichita, KS	100	18”	92	80
Wichita/Ark City 1&2	Ponca City, OK/Wichita, KS	100	8”, 10”	105	55
Wood River	Medford, OK/Mt. Vernon, MO	100	10”, 12”	287	45
Explorer	Texas Gulf Coast/Chicago, IL	19	24”, 28”	1,835	500
Sweeny to Pasadena [1] (PSXP)	Sweeny, TX/Pasadena, TX	75	12”, 18”	120	264
LA Basin	Los Angeles, CA	100	6”- 20”	89	357
Richmond	Rodeo, CA/Richmond, CA	100	6”	14	26
NGL					
Powder River	Sage Creek, WY/Borger, TX	100	6”-8”	695	19
Skelly-Belvieu	Skellytown, TX/Mont Belvieu, TX	50	8”	571	45
TX Panhandle Y1/Y2	Sherhan, TX/Borger, TX	100	3”-10”	299	73
Chisholm	Kingfisher, OK/Conway, KS	50	4”-10”	202	42
Line EZ [2]	Benedum, TX/Sweeny, TX	100	10”	434	101
MexTex [2]	Artesia, NM/Benedum, TX	100	4”-12”	305	51
Sweeny EP [2]	Mont Belvieu, TX/Sweeny, TX	100	8”	85	40
Sand Hills [4]	Permian Basin/Mont Belvieu, TX	33	20”	720	200
Southern Hills [4]	U.S. Midcontinent/Mont Belvieu, TX	33	20”	800	175
LPG					
Blue Line	Borger, TX/East St. Louis, IL	100	8”-12”	667	29
Conway to Wichita	Conway, KS/Wichita, KS	100	12”	55	38
Medford	Ponca City, OK/Medford, OK	100	4”-6”	42	15, 60
Sweeny Propane/Butane [2]	Clemens, TX/Pasadena, TX	100	8”	65	31
NATURAL GAS					
Rockies Express	Meeker, CO/Clarington, OH	25	36”-42”	1,679	1.8 BCFD

[1] Ownership interest excludes noncontrolling interests.
[2] 100 percent interest held by CPChem. Operated by Phillips 66.
[3] Total pipeline system is 419 miles. Phillips 66 has ownership interest in multiple segments totaling 49 miles.
[4] Phillips 66 has a direct one-third ownership in the pipeline entities; operated by DCP Midstream.

FINISHED PRODUCTS TERMINALS *as of March 31, 2014*

FACILITY NAME	LOCATION	STORAGE CAPACITY (MBbl)	RACK CAPACITY (MBD)
Albuquerque	New Mexico	244	18
Amarillo	Texas	277	26
Billings	Montana	88	16
Bozeman	Montana	113	13
Colton	California	211	21
Denver	Colorado	310	36
Des Moines	Iowa	206	15
East St. Louis (PSXP)	Illinois	2,245	78
Freeport*	Texas	1,151	N/A
Glenpool	Oklahoma	366	17
Great Falls	Montana	157	12
Hartford (PSXP)	Illinois	1,075	25
Helena	Montana	178	10
Jefferson City (PSXP)	Missouri	110	16
Kansas City (PSXP)	Kansas	1,294	66
La Junta	Colorado	101	10
Lincoln	Nebraska	219	21
Linden	New Jersey	429	121
Lubbock	Texas	179	17
Missoula	Montana	348	29
Moses Lake	Washington	186	10
Mount Vernon	Missouri	363	46
North Salt Lake	Utah	657	41
Oklahoma City	Oklahoma	341	48
Pasadena (PSXP)	Texas	3,210	65
Ponca City	Oklahoma	51	23
Portland	Oregon	664	33
Renton	Washington	228	20
Richmond	California	334	28
Rock Springs	Wyoming	125	19
Sacramento	California	141	13
Sheridan	Wyoming	86	15
Spokane	Washington	351	24
Tacoma	Washington	307	17
Tremley Point	New Jersey	1,593	39
Westlake	Louisiana	128	16
Wichita Falls	Texas	303	15
Wichita North (PSXP)	Kansas	679	12
Wichita South	Kansas	216	21
Wilmington	California	161	75

CRUDE AND OTHER TERMINALS *as of March 31, 2014*

FACILITY NAME	LOCATION	STORAGE CAPACITY (MBbl)
Billings	Montana	270
Borger	Texas	678
Clifton Ridge Marine Terminal (PSXP)	Louisiana	3,410
Cushing	Oklahoma	700
Freeport*	Texas	955
Junction	California	523
Lake Charles, Coke Handling	Louisiana	N/A
McKittrick	California	237
Odessa	Texas	523
Pecan Grove (PSXP)	Louisiana	142
Ponca City	Oklahoma	1,200
Santa Margarita	California	335
Santa Maria	California	112
Tepetate	Louisiana	152
Torrance	California	309
Wichita Falls	Texas	240

* Refining asset.

MIDSTREAM

Phillips 66 Partners is a growth-oriented, traditional MLP formed by Phillips 66 as part of our strategy to grow our Midstream business.

PHILLIPS 66 PARTNERS

Phillips 66 Partners is a growth-oriented, traditional MLP formed by Phillips 66 as part of our strategy to grow our Midstream business. The partnership was formed to own, operate, develop and acquire primarily fee-based crude oil, refined petroleum products and NGL pipelines and terminals, and other transportation and midstream assets. Phillips 66 Partners successfully completed its IPO in July 2013, and its units trade on the New York Stock Exchange under the ticker symbol PSXP.

Phillips 66 has majority ownership of Phillips 66 Partners and acts as the general partner with full management and operating responsibility for the business. The remaining noncontrolling interest, consisting of limited partner common units, was sold in the IPO.

We believe that Phillips 66 Partners provides value to Phillips 66 shareholders, highlights the value of our logistics and infrastructure assets, and will be an integral vehicle to support growth in transportation and midstream infrastructure.

Headquartered in Houston, the partnership's initial assets at completion of the IPO included the Clifton Ridge crude oil pipeline, terminal and storage system in Louisiana; the Sweeny to Pasadena refined petroleum products pipeline, terminal and storage system in Texas; and the Hartford Connector refined petroleum products pipeline, terminal and storage system in Illinois.

On March 1, 2014, Phillips 66 Partners executed its first post-IPO acquisition, purchasing from Phillips 66 the Gold Line products system, an interstate refined petroleum products pipeline, terminal and storage system running from Texas to Illinois, and two refinery-grade propylene storage spheres in Medford, Oklahoma.

The partnership will continue to pursue acquisitions from Phillips 66 and third parties, as well as organic growth opportunities, which we expect will allow it to deliver top-quartile distribution growth.

PHILLIPS 66 PARTNERS AS OF MARCH 31, 2014



PHILLIPS 66 PARTNERS[1] *as of March 31, 2014*

PIPELINES

NAME	ORIGINATION/TERMINUS	SIZE	MILES	CAPACITY (MBD)
CRUDE OIL PIPELINES				
Clifton Ridge Crude System				
	Clifton Ridge/Lake Charles Refinery	20"	10	300
	Pecan Grove/Clifton Ridge	12"	0.6	84
	Shell/Clifton Ridge	20"	0.6	312
PETROLEUM PRODUCTS PIPELINES				
Sweeny to Pasadena Products System				
	Sweeny Refinery/Pasadena, TX	12"	60	125
	Sweeny Refinery/Pasadena, TX	18"	60	138
Hartford Connector Products System				
	Wood River Refinery/Hartford, IL	12"	3	80
	Hartford, IL/Explorer Pipeline	24"	1	430
Gold Line Products System				
	Borger Refinery/Wichita, KS	16"	273	120
	Wichita, KS/Paola, KS	16"	143	132
	Paola, KS/East St. Louis, IL	8"-12"	265	53
	Paola, KS/Kansas City, KS	8"	53	24
	Paola, KS/Kansas City, KS	10"	53	72

TERMINALS AND STORAGE ASSETS

NAME	TANK SHELL STORAGE CAPACITY (MBbl)	RACK CAPACITY (MBD)
Clifton Ridge Crude System		
Clifton Ridge Terminal	3,410	12
Pecan Grove Storage	142	N/A
Sweeny to Pasadena Products System		
Pasadena Terminal	3,210	65
Hartford Connector Products System		
Hartford Terminal	1,075	25
Gold Line Products System		
East St. Louis Terminal	2,245	78
Jefferson City Terminal	110	16
Kansas City Terminal	1,294	66
Wichita North Terminal	679	12
Medford Spheres[2]	70	N/A

MARINE ASSETS

NAME	THROUGHPUT CAPACITY (Thousands of barrels per hour)
Clifton Ridge Crude System	
Clifton Ridge Ship Dock	48
Pecan Grove Barge Dock	6
Hartford Connector Products System	
Hartford Barge Dock	3

[1] Phillips 66 Partners ownership percentage for assets listed above is 100 percent.

[2] Medford Spheres are newly constructed assets that began operations in March 2014.

MIDSTREAM

DCP MIDSTREAM

DCP Midstream is equally owned by Phillips 66 and Spectra Energy. Headquartered in Denver, Colorado, DCP Midstream leads the midstream industry as one of the nation's largest natural gas gatherers and processors and one of the largest producers and marketers of NGL in the United States. Operations include gathering and transporting raw natural gas and NGL through approximately 67,500 miles of pipeline as of March 31, 2014. The collected gas is processed at 64 owned or operated plants and treaters. Additionally, DCP Midstream owns or operates 12 NGL fractionators.

In 2005, DCP Midstream sponsored an MLP, DCP Midstream Partners LP (DCP Partners). DCP Partners gathers, compresses, treats, processes, transports, stores and sells natural gas. It also produces, fractionates, transports, stores and sells NGL, and recovers and sells condensate. DCP Partners is also a leading distributor of propane. The partnership's units trade on the New York Stock Exchange under the ticker symbol DPM.

Through recent additions of the Sand Hills, Southern Hills, Texas Express and Front Range pipelines, DCP Midstream has approximately 4,500 miles of NGL pipelines across its system as of March 31, 2014, more than double what it had in 2010. These pipelines connect plants in the Front Range, Midcontinent, Permian and Eagle Ford basins to premium markets on the Texas Gulf Coast.

DCP Midstream is a large integrated service provider with strategically located assets in liquids-rich developments. Growing industry demand continues to drive infrastructure needs and provide attractive

DCP MIDSTREAM AND DCP MIDSTREAM PARTNERS ASSETS AS OF MARCH 31, 2014



DCP Midstream is one of the nation's largest natural gas gatherers and processors, and one of the largest producers and marketers of NGL in the United States.

DCP OPERATING DATA *as of March 31, 2014*

NAME	GAS AND NGL GATHERING AND TRANSMISSION SYSTEMS (MILES)	OWNED AND OPERATED PLANTS	PLANTS OPERATED BY THIRD-PARTY	FRACTIONATORS	PLANT THROUGHPUT (TBtu/d)	NGL PRODUCTION (MBbl/d)
REGION						
Midcontinent	29,900	12	1	-	1.9	122
Permian	18,200	16	1	1	1.3	134
East Texas-North Louisiana	2,400	5	-	1	0.8	35
Eagle Ford	6,100	7	-	3	1.2	76
Rocky Mountain	4,800	9	-	-	0.7	52
Gulf Coast	1,400	4	-	2	0.4	21
Barnett Shale	200	2	4	-	-	5
Antrim Shale	500	3	-	-	0.2	-
Logistics	4,000	-	-	5	-	-
Total	**67,500**	**58**	**6**	**12**	**6.5**	**445**

expansion opportunities. DCP Midstream expects to execute $4 billion to $6 billion in growth projects from 2014 to 2016.

KEY PROJECTS

The 800-mile Southern Hills Pipeline provides improved market access for growing Midcontinent NGL production. Extensions lead to the Mont Belvieu market hub and various receipt points in the Midcontinent. The pipeline was placed in service in the second quarter of 2013. Phillips 66, Spectra Energy Partners and DCP Partners each own a one-third interest in the entity that owns the pipeline. The regulated, common-carrier pipeline will ramp up to a capacity of 175,000 BPD after completion of planned pump stations in 2014.

The 720-mile Sand Hills Pipeline was developed to meet growing demand in the Permian Basin and Eagle Ford shale. Service from the Eagle Ford shale began in December 2012, and deliveries from the Permian Basin started in the second quarter of 2013. Phillips 66, Spectra Energy Partners and DCP Partners each own a one-third interest in the entity that owns the pipeline. The common-carrier pipeline has a capacity of more than 200,000 BPD after completion of initial pump stations in early 2014. Further capacity increases to 350,000 BPD are possible with the installation of additional pump stations.

DCP Partners began operations at several newly built natural gas processing plants in 2013, including the 200 million-cubic-feet-per-day (MMCFD) Eagle Plant near Edna, Texas, and the 110 MMCFD O'Connor Plant near Kersey, Colorado. One of DCP Partners' joint-venture assets, the approximately 580-mile Texas Express Pipeline, began operations in late 2013 to deliver NGL to Mont Belvieu. DCP Midstream's 75 MMCFD Rawhide Plant in Glasscock County, Texas, also began operations in 2013.

In the first quarter of 2014, DCP Partners' 200 MMCFD Goliad Plant in Goliad, Texas, began operations. Additionally, in the first quarter of 2014, an expansion of DCP Partners' O'Connor Plant in the Denver-Julesburg Basin increased the plant's capacity to 160 MMCFD. Another of DCP Partners' joint-venture projects, the approximately 435-mile Front Range Pipeline, was placed into service in the first quarter of 2014. The pipeline transports NGL from the Denver-Julesburg Basin to the Texas Express Pipeline.

DCP Partners also holds an ownership interest in a joint venture that is constructing the Keathley Canyon Connector, a 215-mile subsea natural gas gathering pipeline for production from the Keathley Canyon, Walker Ridge and Green Canyon areas in the central deep-water Gulf of Mexico. The pipeline is expected to be completed in the fourth quarter of 2014.

In the first half of 2014, DCP Midstream announced plans to build a 200 MMCFD sour natural gas processing plant, the Zia II Plant, with associated gathering system expansions in the Permian Basin. The Zia II Plant is expected to start up during the first half of 2015. DCP Partners plans to complete construction and place into service the 200 MMCFD Lucerne 2 Plant in the Denver-Julesburg Basin in mid-2015.

CHEMICALS



In the second quarter of 2014, CPChem began operations at the world's largest on-purpose 1-hexene plant at its Cedar Bayou facility in Baytown, Texas.

Phillips 66's Chemicals segment comprises a 50 percent equity investment in CPChem.

CHEMICALS OVERVIEW

OPERATING HIGHLIGHTS – CPCHEM (100%)	2013	2012	2011
Number of manufacturing sites	35	36	35
Plant gross capacity (BLb/Y)	48	48	41
Net capacity (BLb/Y)	33	34	31
Combined total recordable rate (safety incidents per 200,000 hours)	0.34	0.30	0.41
Employees at year-end (thousands)	5.0	4.7	4.7
Olefins and polyolefins capacity utilization	88	93	94

2013 CPCHEM ACCOMPLISHMENTS

- Received final investment approval to build its world-scale $6 billion USGC Petrochemicals Project, including a 3.3 billion-pound-per-year (BLb/Y) ethane cracker and two 1.1 BLb/Y polyethylene facilities.
- Completed a 22,000 BPD NGL fractionator expansion at its Sweeny facility.
- Increased normal alpha olefins capacity by 75 million pounds per year (MMLb/Y) and completed a study to further expand normal alpha olefin capacity at its Cedar Bayou facility. In June 2014, CPChem received final investment approval for the 220 MMLb/Y expansion project.
- Announced plans to expand its ethylene production by 200 MMLb/Y by adding a 10th furnace to an ethylene unit at its Sweeny facility.
- Completed sale of polystyrene plant located in Zhangjiagang, China.
- CPChem continued construction in 2013 on the world's largest on-purpose 1-hexene plant at its Cedar Bayou facility in Baytown, Texas. The plant began operations in the second quarter of 2014.

CHEMICALS

CPCHEM PROFILE

Headquartered in The Woodlands, Texas, CPChem had approximately 5,000 employees worldwide and approximately $11 billion in assets as of Dec. 31, 2013. CPChem's business is structured around two primary operating segments: Olefins and Polyolefins (O&P), and Specialties, Aromatics and Styrenics (SA&S). The O&P segment produces and markets ethylene, propylene and other olefins products. The majority of the ethylene is consumed within the O&P segment for the production of polyethylene, normal alpha olefins and polyethylene pipe. The SA&S segment manufactures and markets aromatics products, such as benzene, styrene, paraxylene and cyclohexane, as well as polystyrene and styrene-butadiene copolymers. SA&S also manufactures and markets a variety of specialty chemical products, including organosulfur chemicals, solvents, drilling chemicals, mining chemicals and high-performance engineering plastics and compounds.

CPCHEM IS THE:

- Largest producer of high-density polyethylene in the world.
- Fourth-largest ethylene producer in North America.
- Second-largest cyclohexane producer and largest cyclohexane marketer in the world.
- Second-largest alpha olefins producer in the world.

CPCHEM'S PRIMARY BRANDS INCLUDE:

- Marlex® polyethylene, a premium extrusion and rigid packaging resin.
- MarFlex® polyethylene, a superior flexible packaging resin.
- K-Resin® styrene-butadiene copolymer (SBC), the number one brand of SBC in the world.
- Soltex® drilling mud additive, a high-temperature/high-pressure fluid loss control additive for water-based muds.
- Scentinel® Gas Odorants, which are added to natural gas to give it a distinctive smell, a vital safety measure.

CPCHEM WORLDWIDE OPERATIONS AS OF DEC. 31, 2013



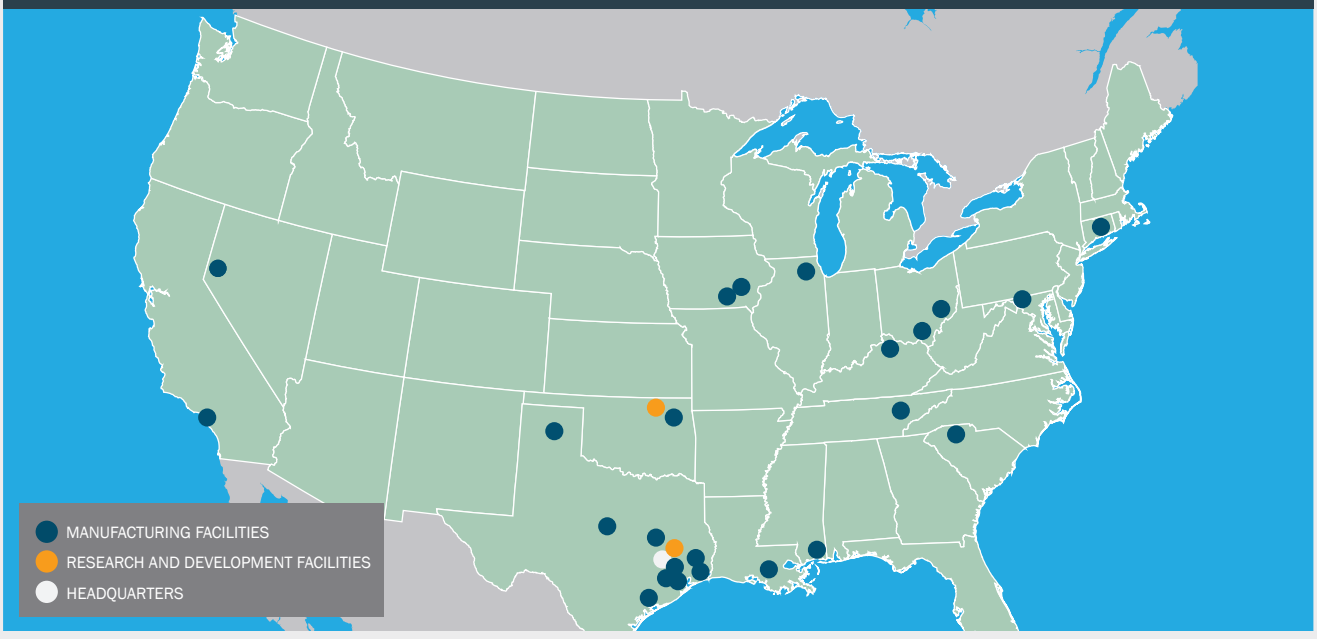
CPChem, through its subsidiaries and equity affiliates, has 35 manufacturing sites located in Belgium, China, Colombia, Qatar, Saudi Arabia, Singapore, South Korea and the United States. In addition, CPChem has two research and development centers. These facilities provide petrochemical and polymer research and an advanced analytical sciences group to support new catalyst development, product and process development, and commercial process support for all of its major product lines. CPChem employs more than 260 scientists, researchers and engineers in its research facilities.

CPChem's state-of-the-art plastics technical center is equipped with the latest processing and testing technology for the molding and extruding of polymer and copolymer resins.

CPChem's loop slurry process for high-density polyethylene production is one of the most widely licensed processes in the world, with more than 80 commercial reactor facilities utilizing this technology. Another technological achievement is CPChem's proprietary Aromax® technology, the lowest-cost process for on-purpose production of benzene.

Other technological achievements and proprietary technologies include: on-purpose 1-hexene technology; normal alpha olefin and polyalphaolefin production technology; proprietary acetylene reduction catalyst technology; K-Resin® SBC technology; methyl mercaptan process technology; and first- and second-generation functional drilling fluid technology.

CPCHEM U.S. OPERATIONS AS OF DEC. 31, 2013



CHEMICALS

KEY PROJECTS

The development of shale gas resources in the United States provides significant opportunities on the U.S. Gulf Coast for CPChem. The rise in shale oil and natural gas production creates cost-advantaged NGL feedstocks and lower energy costs.

During 2013, CPChem completed an NGL fractionator expansion at its Sweeny facility. The project increased capacity by 22,000 BPD or 19 percent.

In 2013, CPChem received final investment approval to build its world-scale USGC Petrochemicals Project. The project includes a 3.3 BLb/Y ethane cracker to be built at CPChem's Cedar Bayou facility in Baytown, Texas, and two 1.1 BLb/Y polyethylene facilities that will be located near its Sweeny facility in Old Ocean, Texas. It will be one of the first major cracker complexes developed on the Gulf Coast since the shale production boom and will utilize lower-priced ethane feedstock. The approximately $6 billion project is scheduled to start up in 2017 and is expected to increase CPChem's U.S. ethylene capacity by more than 40 percent.



CPChem's Cedar Bayou facility in Baytown, Texas.

CPCHEM U.S. GULF COAST MANUFACTURING FACILITIES AS OF DEC. 31, 2013



CPChem's $6 billion USGC Petrochemical Project will include one of the first major ethane cracker complexes developed on the Gulf Coast since the shale production boom began.

Another of CPChem's projects is the world's largest on-purpose 1-hexene plant at its Cedar Bayou facility. The plant began operations in the second quarter of 2014 and has capacity of 550 MMLb/Y. The primary product, 1-hexene, is a key component in the manufacturing of polyethylene, a plastic resin commonly converted into film, pipe, detergent bottles and food and beverage containers.

In June 2014, CPChem received final investment approval to expand its normal alpha olefin capacity at Cedar Bayou. After achieving 75 MMLb/Y of additional capacity through a number of small projects in 2013, the incremental expansion is expected to add 220 MMLb/Y to the current capacity of 1.6 BLb/Y in a phased approach. The project is anticipated to be completed in July 2015.

CPChem also announced plans to expand its ethylene production by 200 MMLb/Y by adding a 10th furnace to an ethylene unit at its Sweeny facility. The project is expected to start up in the third quarter of 2014.

CPChem expanded its sulfur-based products capacity at its Tessenderlo, Belgium, facility by more than 40 percent. Construction was completed in the second quarter of 2014.



Saudi Polymers Company plant in Jubail Industrial City, Saudi Arabia.

CPCHEM MIDDLE EAST MANUFACTURING FACILITIES
AS OF DEC. 31, 2013



CHEMICALS

CPCHEM NET PETROCHEMICAL AND PLASTICS PRODUCTION CAPACITIES *as of Dec. 31, 2013*

MMLB/Y	U.S.	MIDDLE EAST	WORLDWIDE
O&P			
Ethylene	7,830	2,475	10,305
Propylene	2,675	505	3,180
High-density polyethylene	4,205	1,725	6,500
Low-density polyethylene	620	-	620
Linear low-density polyethylene	490	-	490
Polypropylene	-	310	310
Normal alpha olefins	1,565	515	2,080
Polyalphaolefins	105	-	235
Polyethylene pipe	590	-	590
Total O&P	18,080	5,530	24,310
SA&S			
Benzene	1,600	930	2,530
Cyclohexane	1,060	395	1,455
Paraxylene	1,000	-	1,000
Styrene	1,050	825	1,875
Polystyrene	835	155	1,070
K-Resin® SBC	100	-	170
Specialty chemicals	555	-	655
Ryton® PPS	61	-	81
Total SA&S	6,261	2,305	8,836

WHOLLY OWNED CPCHEM FACILITIES *as of Dec. 31, 2013*

FACILITY/LOCATION	PRODUCTS	CAPACITY (MMLB/Y)
Pasadena Plastics Complex, Pasadena, TX	K-Resin® SBC	100
	High-density polyethylene	2,180
Sweeny Facility, Old Ocean, TX	Ethylene	4,110
	Propylene	870
Borger Facility, Borger, TX	Organosulfur chemicals	180
	Ryton® PPS polymer	40
	Performance and reference fuels	120
	High-purity hydrocarbons and solvents	140
	Mining chemicals	70
Cedar Bayou Facility, Baytown, TX	Ethylene	1,840
	Propylene	1,030
	Normal alpha olefins	1,565
	Polyalphaolefins	105
	Linear low-, low- and high-density polyethylene	2,625
Orange Chemical Facility, Orange, TX	High-density polyethylene	970
Port Arthur Facility, Port Arthur, TX	Ethylene	1,880
	Propylene	775
	Cyclohexane	1,060
Drilling Specialties, Conroe, TX	Drilling specialty chemicals	45
Houston Compounding Facility, La Porte, TX	Ryton® PPS compounds	21
Pascagoula Facility, Pascagoula, MS	Paraxylene	1,000
	Benzene	1,600
Performance Pipe Division, nine locations in the United States	Polyethylene pipe and pipe fittings	590
Tessenderlo Chemicals Facility, Tessenderlo, Belgium	Organosulfur chemicals	100
Kallo Compounding Facility, Kallo-Beveren, Belgium	Ryton® PPS compounds	20
Beringen, Belgium Facility, Beringen, Belgium	Polyalphaolefins	130

JOINT-VENTURE CPCHEM FACILITIES *as of Dec. 31, 2013*

FACILITY/LOCATION	CPCHEM OWNERSHIP (PERCENT)	PRODUCTS	GROSS CAPACITY (MMLB/Y)
Americas Styrenics, St. James, LA	50	Styrene	2,100
Americas Styrenics, Joliet, IL	50	Polystyrene	270
Americas Styrenics, Allyn's Point, CT	50	Polystyrene	250
Americas Styrenics, Hanging Rock, OH	50	Polystyrene	400
Americas Styrenics, Torrance, CA	50	Polystyrene	330
Americas Styrenics, Marietta, OH	50	Polystyrene	420
Americas Styrenics, Cartagena, Colombia	50	Polystyrene	160
Qatar Chemical Company Ltd., Mesaieed, Qatar	49	Ethylene	1,150
		High-density polyethylene	1,010
		1-hexene	130
Qatar Chemical Company II Ltd., Mesaieed, Qatar	49	High-density polyethylene	770
		Normal alpha olefins	760
Ras Laffan Olefins Company (RLOC), Ras Laffan, Qatar	26	Ethylene	2,870
Chevron Phillips Singapore, Chemicals (Private) Limited, Singapore	50	High-density polyethylene	880
Shanghai Golden Phillips Petrochemical Co., Jinshanwei, China	40	High-density polyethylene	320
Saudi Polymers Company, Jubail Industrial City, Saudi Arabia	35	Ethylene	2,690
		Propylene	970
		High-density polyethylene	2,425
		Polypropylene	880
		Polystyrene	440
		1-hexene	220
Saudi Chevron Phillips Company, Jubail Industrial City, Saudi Arabia	50	Benzene	1,865
		Cyclohexane	790
Jubail Chevron Phillips Company, Jubail Industrial City, Saudi Arabia	50	Styrene	1,650
		Ethylene	450
		Propylene	330
K R Copolymer Co., Ltd., Yeosu, South Korea	60	K-Resin® SBC	115

REFINING



With a gross crude oil processing capacity of 314,000 BPD, the Wood River Refinery in Roxana, Illinois, is the largest refinery in the Phillips 66 portfolio.

Phillips 66's U.S. Refining assets are integrated with Transportation, Marketing and Commercial activities. Phillips 66 also owns or has an interest in three refineries in Europe and one refinery in Asia.

REFINING OVERVIEW

OPERATING HIGHLIGHTS	2013	2012	2011
Crude oil processed (MBD)	2,079	2,064	2,166
Crude oil capacity utilization (percent)	93	93	92
Clean product yield (percent)	84	84	84
Distillate yield (percent)	40	40	40
U.S. crude processing capacity (MBD)	1,816[1]	1,806[2]	1,801
International crude processing capacity (MBD)	430	430	426
Worldwide crude processing capacity (MBD)	2,246[1]	2,236[2]	2,227
Combined total recordable rate (safety incidents per 200,000 hours)	0.26	0.23	0.35

[1] As of Jan. 1, 2014.

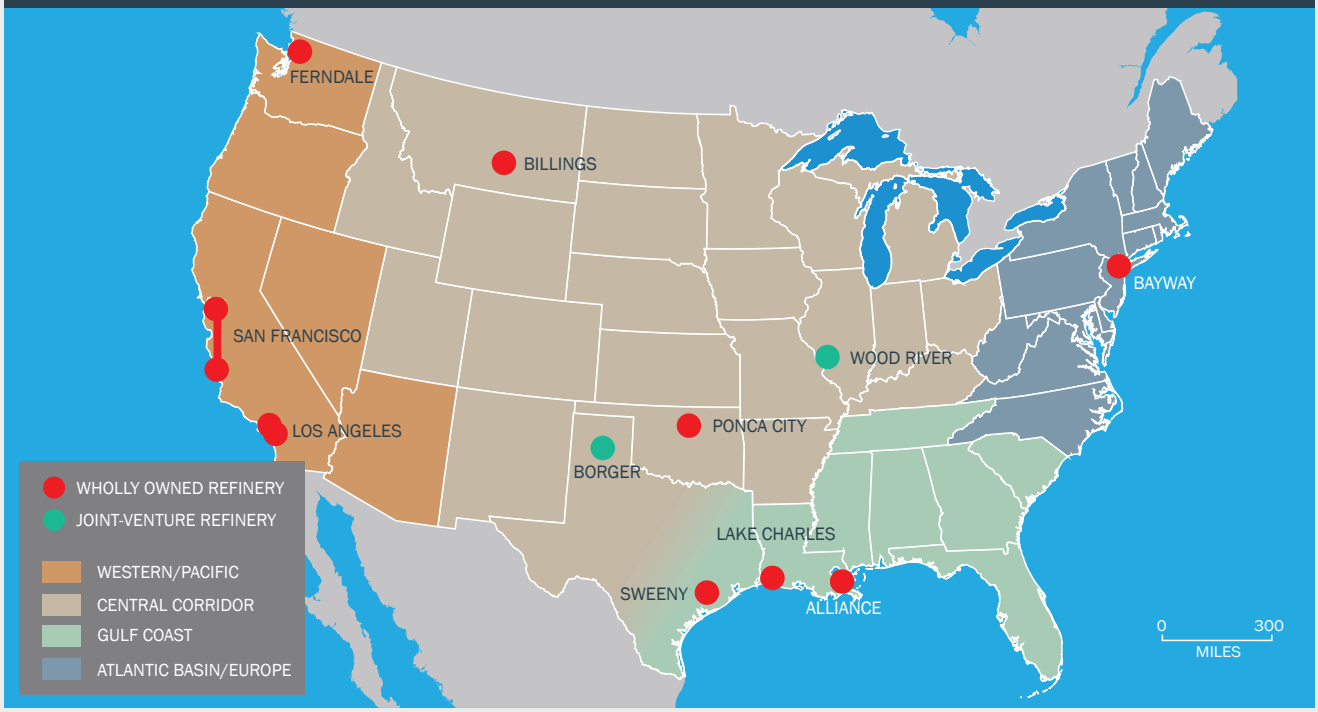
[2] As of Jan. 1, 2013.

2013 ACCOMPLISHMENTS

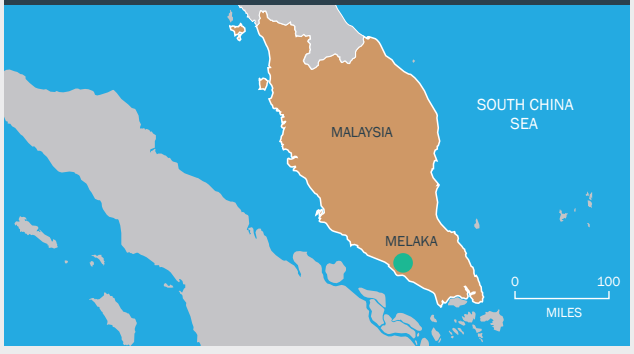
- Ongoing focus on safety, with multiple facilities earning external recognition for superior safety performance during the year.
- Increased domestic advantaged crude processing to 74 percent of total crude runs in 2013, compared to 62 percent in 2012.
- Captured strong refining margins in the Central Corridor Region.
- Continuing improvements in optimization and increasing clean product yield.
- Achieved industry-leading distillate yield of approximately 40 percent.
- Global refinery utilization rate of 93 percent in 2013, well above industry average.
- Expanded U.S. refined product export capability to 410,000 BPD by the end of 2013.

REFINING

U.S. REFINING AS OF DEC. 31, 2013



ASIA REFINING AS OF DEC. 31, 2013



EUROPE REFINING AS OF DEC. 31, 2013



WORLDWIDE REFINING AS OF DEC. 31, 2013

Region	Capacity (MBD)				Crude Mix (Percent)		Average Nelson Complexity Factor	Average Clean Product Yield (Percent)
	Crude[1]	Total	Gasoline[3]	Distillate[3]	Light/Medium	Heavy		
Western/Pacific[2]	440	488	210	205	45	55	11.6	85
Central Corridor[2]	485	531	265	185	60	40	11.1	87
Gulf Coast	733	855	340	355	65	35	12.2	82
Atlantic Basin/Europe[2]	588	657	270	285	85	15	9.0	83
Worldwide	2,246	2,531	1,085	1,030	65	35	11.0	84

[1] As of Jan. 1, 2014.
[2] Includes Phillips 66's share of joint-venture refineries.
[3] Clean product capacities are maximum rates for each clean product category, independent of each other. The capacities are not additive when calculating the average clean product yield.

KEY STRATEGIES

In 2013, Phillips 66 continued its strategy of aggressively pursuing increased access to advantaged crude oil to run in its refineries by expanding its own system capabilities and partnering with third-party transportation providers. Our 2013 U.S. refinery crude slate was 74 percent advantaged, compared with 62 percent in 2012. This increase was primarily due to processing 239,000 BPD of shale and similar tight oils, 118,000 BPD more than in 2012, as well as to additional domestic crudes consistently trading at a discount to Brent crude. Our Refining, Commercial and Transportation businesses work in collaboration to develop strategies for accessing advantaged crude with the goal of having our U.S. refineries capable of processing 100 percent advantaged crudes by the end of 2016.

By the end of 2013, we had 2,000 new railcars in service delivering primarily Bakken shale crude oil from North Dakota to our Bayway Refinery in New Jersey and our Ferndale Refinery in Washington. We are building new rail offloading facilities at these refineries that are expected to be operational in the second half of 2014. In early 2014, we ordered another 1,200 crude oil railcars that are expected to be delivered by the end of the year. We continue to use third-party logistics companies to deliver advantaged crude oil to our refineries and signed several new crude logistics agreements in 2013.

Phillips 66 is also making modest investments in its refineries to increase export capabilities and liquids yields. In 2013, we removed constraints at our coastal refineries to increase our total U.S. export capacity from 285,000 BPD in 2012 to 410,000 BPD. Over the next few years, we expect to achieve a clean product yield improvement of 1 percent with minimal capital investment. We are specifically focused on increasing yields of diesel because we expect global diesel demand to grow faster than gasoline demand. We already have an industry-leading distillate yield of about 40 percent and expect to achieve another 1 percent increase over the next few years.

REFINING

REFINING WESTERN/PACIFIC *as of Dec. 31, 2013*



Ferndale Refinery

101
CRUDE CAPACITY (MBD)

108
TOTAL CAPACITY (MBD)

55
GASOLINE CAPACITY (MBD)

30
DISTILLATE CAPACITY (MBD)

7.3
NELSON COMPLEXITY FACTOR

75%
CLEAN PRODUCT YIELD CAPABILITY

The Ferndale Refinery is located on Puget Sound in Ferndale, Washington, about 20 miles south of the U.S.-Canada border. The refinery processes Alaskan North Slope, sour Canadian and U.S. shale crude oils.

Ferndale operates a deepwater dock capable of accommodating tankers transporting Alaskan North Slope crude oil from Valdez, Alaska. It also receives Canadian crude oil via pipeline and U.S.-advantaged crude via a combination of rail and barge transport. Ferndale Refinery facilities include a fluid catalytic cracker, an alkylation unit, hydrotreating units and a naphtha reformer.

The refinery primarily produces transportation fuels, such as gasoline and diesel fuels. Other products include fuel oil supplying the northwest marine transportation market. Most refined products are distributed by pipeline and barge to major markets in the northwest United States. Recent improvements have enhanced the refinery's ability to export refined products.

In 2013, the necessary permits were received for a rail offloading facility that is expected to be operational in the second half of 2014. This facility will have capacity of 30,000 BPD and will enable the refinery to access additional advantaged crudes.



Los Angeles Refinery

139
CRUDE CAPACITY (MBD)

160
TOTAL CAPACITY (MBD)

80
GASOLINE CAPACITY (MBD)

65
DISTILLATE CAPACITY (MBD)

14.3
NELSON COMPLEXITY FACTOR

89%
CLEAN PRODUCT YIELD CAPABILITY

The Los Angeles Refinery is composed of two linked facilities located roughly five miles apart in Carson and Wilmington, California, about 15 miles southeast of Los Angeles International Airport. Carson serves as the front portion of the refinery by processing crude oil, and Wilmington serves as the back portion by upgrading the intermediate products to finished products.

The refinery processes mainly heavy, high-sulfur crude oil. It receives domestic crude oil via pipeline from California and both foreign and domestic crude oils by tanker through a third-party terminal in the Port of Long Beach. The refinery produces a high percentage of transportation fuels, such as gasoline, diesel and aviation fuels. Other products include fuel-grade petroleum coke.

The facilities include fluid catalytic cracking, alkylation, hydrocracking, coking and naphtha reforming units. The refinery produces California Air Resources Board (CARB)-grade gasoline and diesel fuels. Refined products are distributed to customers in California, Nevada and Arizona by pipeline and truck. Recent improvements have enhanced the refinery's ability to export refined products.

Phillips 66 is expanding its U.S. refined products export capability and expects to increase its export capacity to 550,000 BPD by the end of 2016.



San Francisco Refinery

120
CRUDE CAPACITY (MBD)

135
TOTAL CAPACITY (MBD)

55
GASOLINE CAPACITY (MBD)

60
DISTILLATE CAPACITY (MBD)

14.1
NELSON COMPLEXITY FACTOR

84%
CLEAN PRODUCT YIELD CAPABILITY

The San Francisco Refinery is comprised of two facilities linked by a 200-mile pipeline. The Santa Maria facility is located in Arroyo Grande, California, while the Rodeo facility is in the San Francisco Bay Area.

The refinery processes a mixture of heavy, high-sulfur and light sweet crude oils. It receives California crude oil via pipeline and both domestic and foreign crude oils by tanker. Semi-refined products from the Santa Maria facility are sent by pipeline to the Rodeo facility for upgrading into finished petroleum products. A large proportion of the refinery's production is transportation fuel, such as gasoline and diesel fuels.

Process facilities include coking, hydrocracking, hydrotreating and naphtha reforming units. The refinery produces CARB-grade gasoline and diesel fuels. The majority of refined products are distributed by pipeline, railcar and barge to customers in California. Recent improvements have enhanced the refinery's ability to export refined products.



Melaka Refinery[1]

80
CRUDE CAPACITY (MBD)

85
TOTAL CAPACITY (MBD)

20
GASOLINE CAPACITY (MBD)

50
DISTILLATE CAPACITY (MBD)

8.9
NELSON COMPLEXITY FACTOR

80%
CLEAN PRODUCT YIELD CAPABILITY

The PSR-2 refinery in Melaka, Malaysia, is a joint venture with Petronas, the Malaysian state oil company. Phillips 66 owns a 47 percent interest in the joint venture. The medium, high-sulfur crude oil processed by the refinery is sourced mostly from the Middle East.

The refinery produces a full range of refined petroleum products and capitalizes on hydrocracking and coking technology to upgrade low-cost feedstocks to higher-margin products. Phillips 66's share of refined products is transported by tanker and marketed in Malaysia and other Asian markets.

[1]Reflects Phillips 66's equity share.

REFINING

REFINING CENTRAL CORRIDOR *as of Dec. 31, 2013*



Billings Refinery

59
CRUDE CAPACITY (MBD)

65
TOTAL CAPACITY (MBD)

35
GASOLINE CAPACITY (MBD)

25
DISTILLATE CAPACITY (MBD)

14.0
NELSON COMPLEXITY FACTOR

89%
CLEAN PRODUCT YIELD CAPABILITY

The Billings Refinery, located in Billings, Montana, processes a mixture of Canadian heavy, high-sulfur crude oil plus domestic high-sulfur and low-sulfur crude oils, all delivered via pipeline and truck.

The facilities include fluid catalytic cracking, naphtha reforming and hydrodesulfurization units. A delayed coker converts heavy, high-sulfur residue into higher-value light oils. The refinery produces a high percentage of transportation fuels, such as gasoline, diesel and aviation fuels, as well as fuel-grade petroleum coke. Finished petroleum products from the refinery are delivered via pipeline, railcar and truck. Pipelines transport most of the refined products to markets in Montana, Wyoming, Idaho, Utah, Colorado and Washington.



Ponca City Refinery[1]

196
CRUDE CAPACITY (MBD)

210
TOTAL CAPACITY (MBD)

105
GASOLINE CAPACITY (MBD)

80
DISTILLATE CAPACITY (MBD)

9.4
NELSON COMPLEXITY FACTOR

92%
CLEAN PRODUCT YIELD CAPABILITY

The Ponca City Refinery, located in Ponca City, Oklahoma, processes a mixture of light, medium and heavy crude oils. Most of the crude oil processed is received by pipeline from Oklahoma, Texas and Canada. Recent and ongoing transportation infrastructure improvements have enabled the delivery of increased volumes of locally produced advantaged crude oil via pipeline and truck.

The Ponca City Refinery is a high-conversion facility that produces a full range of products, including gasoline, diesel and aviation fuels; liquefied petroleum gas (LPG); and anode-grade petroleum coke. Its facilities include two fluid catalytic cracking units, alkylation, delayed coking, naphtha reforming and hydrodesulfurization units. Finished petroleum products are shipped by truck, railcar, and pipelines to markets throughout the Midcontinent region.

[1] Crude capacity as of Jan. 1, 2014.

Our 2013 U.S. refinery crude slate was 74 percent advantaged, compared with 62 percent in 2012.



Borger Refinery[2]

73
CRUDE CAPACITY (MBD)

90
TOTAL CAPACITY (MBD)

50
GASOLINE CAPACITY (MBD)

25
DISTILLATE CAPACITY (MBD)

12.3
NELSON COMPLEXITY FACTOR

89%
CLEAN PRODUCT YIELD CAPABILITY

The Borger Refinery is located in Borger, Texas, in the Texas Panhandle about 50 miles north of Amarillo. Jointly owned by Phillips 66 and Cenovus Energy, the Borger Refinery is operated by Phillips 66. It includes an NGL fractionation facility with gross capacity of 45,000 BPD. The refinery primarily processes medium sour crude oil and NGL delivered through pipelines from West Texas, the Texas Panhandle, Wyoming and Canada.

The refinery facilities include two fluid catalytic cracking units, alkylation, delayed coking, hydrodesulfurization and naphtha reforming that enable it to produce a high percentage of transportation fuels, such as gasoline, diesel and aviation fuels, as well as petroleum coke, NGL and solvents. Pipelines move refined products to West Texas, New Mexico, Colorado and the Midcontinent region.



Wood River Refinery[1, 2]

157
CRUDE CAPACITY (MBD)

166
TOTAL CAPACITY (MBD)

75
GASOLINE CAPACITY (MBD)

55
DISTILLATE CAPACITY (MBD)

11.8
NELSON COMPLEXITY FACTOR

83%
CLEAN PRODUCT YIELD CAPABILITY

The Wood River Refinery is located about 15 miles northeast of St. Louis, Missouri, in Roxana, Illinois. Jointly owned by Phillips 66 and Cenovus Energy, the Wood River Refinery is operated by Phillips 66. The complex includes a docking area on the Mississippi River. The refinery processes a mix of light, low-sulfur; heavy, high-sulfur; and high-acid crude oils. Wood River receives Canadian and domestic crude oils, including from U.S.-advantaged sources, and other foreign crude oil, by various pipelines. The refinery produces a high percentage of transportation fuels, such as gasoline, diesel and aviation fuels. Other products include petrochemical feedstocks, asphalt and coke.

Operations include two fluid catalytic cracking units, alkylation, hydrocracking, two delayed coking units, naphtha reforming, hydrotreating and sulfur recovery. Wood River is a major supplier to Lambert International Airport in St. Louis and Chicago O'Hare Airport. Finished product leaves Wood River through pipelines and by rail, barge and truck.

[1] Crude capacity as of Jan. 1, 2014. [2] Reflects Phillips 66's equity share.

REFINING

REFINING GULF COAST *as of Dec. 31, 2013*



Alliance Refinery

247
CRUDE CAPACITY (MBD)

275
TOTAL CAPACITY (MBD)

125
GASOLINE CAPACITY (MBD)

120
DISTILLATE CAPACITY (MBD)

11.9
NELSON COMPLEXITY FACTOR

87%
CLEAN PRODUCT YIELD CAPABILITY

The Alliance Refinery, located on the Mississippi River in Belle Chasse, Louisiana, 25 miles south of New Orleans, processes mainly light, low-sulfur crude oil. Alliance receives domestic crude oil from the Gulf of Mexico via pipeline and foreign crude oil from West Africa via pipeline connected to the Louisiana Offshore Oil Port. The refinery also receives U.S.-advantaged crude oil via marine transport.

The single-train refinery's facilities include fluid catalytic cracking, alkylation, coking, and hydrodesulfurization units, a naphtha reformer and aromatics units that enable it to produce a high percentage of transportation fuels, such as gasoline, diesel and aviation fuels. Other products include petrochemical feedstocks, home heating oil and anode-grade petroleum coke.

The majority of the refined products are distributed to customers in the southeastern and eastern United States through major common-carrier pipeline systems and by barge. Recent improvements have enhanced the refinery's ability to export refined products, and Alliance now has the capability to export over 40 percent of its production.



Lake Charles Refinery

239
CRUDE CAPACITY (MBD)

280
TOTAL CAPACITY (MBD)

90
GASOLINE CAPACITY (MBD)

115
DISTILLATE CAPACITY (MBD)

11.3
NELSON COMPLEXITY FACTOR

70%
CLEAN PRODUCT YIELD CAPABILITY

The Lake Charles Refinery, located in Westlake, Louisiana, processes some light, sweet crude oil; however, it primarily processes heavy, high-sulfur and high-acid crude oils. The refinery receives domestic Gulf Coast, U.S.-advantaged and foreign crude oils.

The facilities include crude distillation, a fluid catalytic cracker, alkylation, a delayed coker and hydrodesulfurization units that enable it to produce gasoline and diesel fuels, home heating oil and fuel-grade petroleum coke. The refinery facilities also include a specialty coker and calciner, which produce graphite petroleum coke for the steel industry.

The Lake Charles Refinery produces a high percentage of transportation fuels, such as gasoline and aviation fuels, along with home heating oil. The majority of its refined products are distributed by truck, railcar, barge or major common-carrier pipelines in the southeastern and eastern United States. In addition, refined products can be sold into export markets through the refinery's marine terminal.



Sweeny Refinery

247
CRUDE
CAPACITY (MBD)

300
TOTAL
CAPACITY (MBD)

125
GASOLINE
CAPACITY (MBD)

120
DISTILLATE
CAPACITY (MBD)

13.2
NELSON
COMPLEXITY FACTOR

87%
CLEAN PRODUCT
YIELD CAPABILITY

The Sweeny Refinery, located in Old Ocean, Texas, 65 miles southwest of Houston, processes mainly heavy, high-sulfur crude oil, but also processes light, low-sulfur crude oil. The refinery receives U.S.-advantaged and foreign crude oil primarily through wholly and jointly owned terminals on the Gulf Coast, including a deepwater terminal at Freeport, Texas.

The refinery facilities include two fluid catalytic cracking units, delayed coking, alkylation, a naphtha reformer and hydrodesulfurization units. It operates nearby terminals and storage facilities in Freeport, Jones Creek and on the San Bernard River, along with pipelines that connect these facilities to the refinery.

The refinery produces a high percentage of transportation fuels, such as gasoline, diesel and aviation fuels. Other products include petrochemical feedstocks, home heating oil and fuel-grade petroleum coke. Refined products are distributed throughout the midwest and southeastern United States by pipeline, barge and railcar. Recent improvements have enhanced the refinery's ability to export refined products.

REFINING

REFINING ATLANTIC BASIN/EUROPE *as of Dec. 31, 2013*



Bayway Refinery

238
CRUDE CAPACITY (MBD)

285
TOTAL CAPACITY (MBD)

145
GASOLINE CAPACITY (MBD)

115
DISTILLATE CAPACITY (MBD)

8.1
NELSON COMPLEXITY FACTOR

90%
CLEAN PRODUCT YIELD CAPABILITY

The Bayway Refinery, located on the New York Harbor in Linden, New Jersey, processes mainly light, low-sulfur crude oil. Crude oil is supplied to the refinery by tanker, primarily from the North Sea, Canada and West Africa. U.S.-advantaged crude oil is supplied to the refinery using a combination of rail and marine transport.

Bayway refining units include one of the world's largest fluid catalytic cracking units, hydrodesulfurization units, a naphtha reformer, an alkylation unit and other processing equipment.

The refinery produces a high percentage of transportation fuels, such as gasoline, diesel and aviation fuels, as well as petrochemical feedstocks, residual fuel oil and home heating oil. The facility distributes refined products to East Coast customers via barges, trucks, pipelines and railcars. Bayway also has a 775 MMLb/Y polypropylene plant.

Construction began in 2013 on a rail offloading facility that is expected to be operational in the second half of 2014. This facility will have capacity of 70,000 BPD and will enable the refinery to access additional advantaged crudes.



Whitegate Refinery

71
CRUDE CAPACITY (MBD)

71
TOTAL CAPACITY (MBD)

15
GASOLINE CAPACITY (MBD)

30
DISTILLATE CAPACITY (MBD)

4.2
NELSON COMPLEXITY FACTOR

65%
CLEAN PRODUCT YIELD CAPABILITY

The Whitegate Refinery is located in Cork, Ireland. Whitegate is Ireland's only refinery processes light, low-sulfur crude oil sourced mostly from the North Sea, North Africa and West Africa.

Whitegate primarily produces transportation fuels, such as gasoline, diesel and fuel oil, that are distributed mostly inland, with some exported to international markets. Phillips 66 also operates a crude oil and products terminal with 7.5 million barrels of storage facilitated by an offshore mooring buoy in Bantry Bay, Cork, Ireland, which is about 80 miles southwest of the refinery.



Humber Refinery

221
CRUDE CAPACITY (MBD)

240
TOTAL CAPACITY (MBD)

85
GASOLINE CAPACITY (MBD)

115
DISTILLATE CAPACITY (MBD)

11.7
NELSON COMPLEXITY FACTOR

81%
CLEAN PRODUCT YIELD CAPABILITY

The Humber Refinery is located in North Lincolnshire, United Kingdom. Crude oil processed at the refinery is supplied primarily from the North Sea and includes light-, low- and medium-sulfur and acidic crude oils.

Humber is one of the most sophisticated refineries in Europe. It is a fully integrated facility that produces a large proportion of transportation fuels, such as gasoline, diesel and aviation fuels. Humber's fluid catalytic cracking unit/thermal cracking/coking configuration enables substantial volumes of other feedstocks, such as low-sulfur fuel oil and vacuum gas oil, to be processed alongside crude oil to fully utilize Humber's cracking capability.

The refinery has two coking units with associated calcining plants that upgrade the heavy bottoms and imported feedstocks into light oil products and high-value graphite and anode-grade petroleum coke. Humber, the only coking refinery in the United Kingdom, is the world's largest producer of specialty graphite cokes and Europe's largest anode-grade coke producer. Approximately 60 percent of the light oils produced in the refinery are marketed in the United Kingdom, while the other products are exported to the rest of Europe, West Africa and the United States.



MiRO Refinery[1]

58
CRUDE CAPACITY (MBD)

61
TOTAL CAPACITY (MBD)

25
GASOLINE CAPACITY (MBD)

25
DISTILLATE CAPACITY (MBD)

7.9
NELSON COMPLEXITY FACTOR

85%
CLEAN PRODUCT YIELD CAPABILITY

The Mineraloelraffinerie Oberrhein GmbH (MiRO) Refinery, located on the Rhine River in Karlsruhe in southwest Germany, is a joint venture refinery with Phillips 66 holding an 18.75 percent interest. The other owners are Shell, ExxonMobil and Ruhr Oel GmbH. Phillips 66 processes mainly medium sweet and medium sour crude oils in its share of the refinery. Crude is sourced from Russia, North Africa, the Caspian Sea and the Middle East and is delivered to the refinery via a cross-country pipeline from the port in Trieste, Italy.

The facilities at the high-conversion refinery include three crude unit trains, fluid catalytic cracking, petroleum coking and calcining, hydrodesulfurization units, naphtha reformers, isomerization and aromatics recovery units, ethyl tert-butyl ether, and alkylation units that enable it to produce a high percentage of transportation fuels, such as gasoline and diesel fuels. Other products include petrochemical feedstocks, home heating oil, bitumen, and anode and fuel-grade petroleum coke.

Phillips 66 distributes the majority of its share of the refined products to customers in southwest Germany, northern Switzerland and western Austria by truck, railcar, barge and pipeline.

[1]Reflects Phillips 66's equity share.

MARKETING AND SPECIALTIES



Phillips 66 packages finished lubricants at plants like this one in Hartford, Illinois.

Phillips 66's Marketing and Specialties segment includes marketing of gasoline, diesel and aviation fuel in the United States, as well as marketing of gasoline and diesel in Europe. The segment also includes the company's lubricants, specialty products and power generation businesses.

MARKETING AND SPECIALTIES OVERVIEW

OPERATING HIGHLIGHTS	2013	2012	2011
Marketing gasoline sales (MBD)	1,174	1,101	1,204
Marketing distillate sales (MBD)	967	985	1,039
Marketing petroleum product sales (MBD)	2,158	2,103	2,261
Combined total recordable rate (safety incidents per 200,000 hours)	0.17	0.20	0.13

2013 ACCOMPLISHMENTS

- Sold Immingham Combined Heat and Power Plant in the United Kingdom.
- Record volume of Group II base oil produced by 50-50 joint venture Excel Paralubes®.
- Expanded lubricants line with an energy-saving hydraulic oil and several products to enhance automotive fuel economy.
- Achieved record sales of Liquid Titanium® protection additive lubricant products.
- Announced the exchange of flow improvers business, Phillips Specialty Products Inc., for shares of Phillips 66 stock. The transaction closed in early 2014.

MARKETING AND SPECIALTIES

MARKETING

United States

In the United States, Phillips 66 markets gasoline, diesel and aviation fuel. Most marketing outlets are owned and operated by independent dealers and wholesale marketers. The majority of these outlets are branded Phillips 66®, Conoco® or 76® and feature gasolines that have been recognized as TOP TIER™ by leading automakers. These operations are strategically served by the company's refineries and transportation systems.

In its wholesale operations, Phillips 66 utilizes a network of branded marketers and dealers operating approximately 7,100 outlets. Refined products are sold on both a branded and unbranded basis. The company emphasizes the wholesale channel of trade; however, we also hold brand licensing agreements with approximately 600 other sites.

In addition to automotive gasoline and diesel fuel, the company produces aviation fuels and markets them through independent marketers and dealers at approximately 900 Phillips 66® aviation-branded, fixed-base operations, the largest branded network in the U.S. general aviation industry.

Europe

In Europe, Phillips 66 markets motor fuels under JET® through company-owned outlets in Germany and Austria and dealer-owned outlets in the United Kingdom. The company also has an equity interest in a joint venture that markets motor fuels in Switzerland under Coop®.

Phillips 66 markets aviation fuels, LPG, heating oils, transportation fuels, marine bunker fuels, fuel coke and bitumen to commercial customers and into the bulk or spot market. In addition, substantially all Whitegate Refinery production is sold to local and international oil companies and independent resellers in the inland Ireland market.

As of Dec. 31, 2013, Marketing and Specialties had approximately 1,440 marketing outlets in its European operations, of which approximately 925 were company owned and 315 were dealer owned. The company also held brand licensing agreements with approximately 200 sites. Additionally, through joint-venture operations in Switzerland, Phillips 66 has interests in 275 other sites. Over the next five years, the company expects to build approximately 200 new JET retail sites, mainly in Germany and Austria.



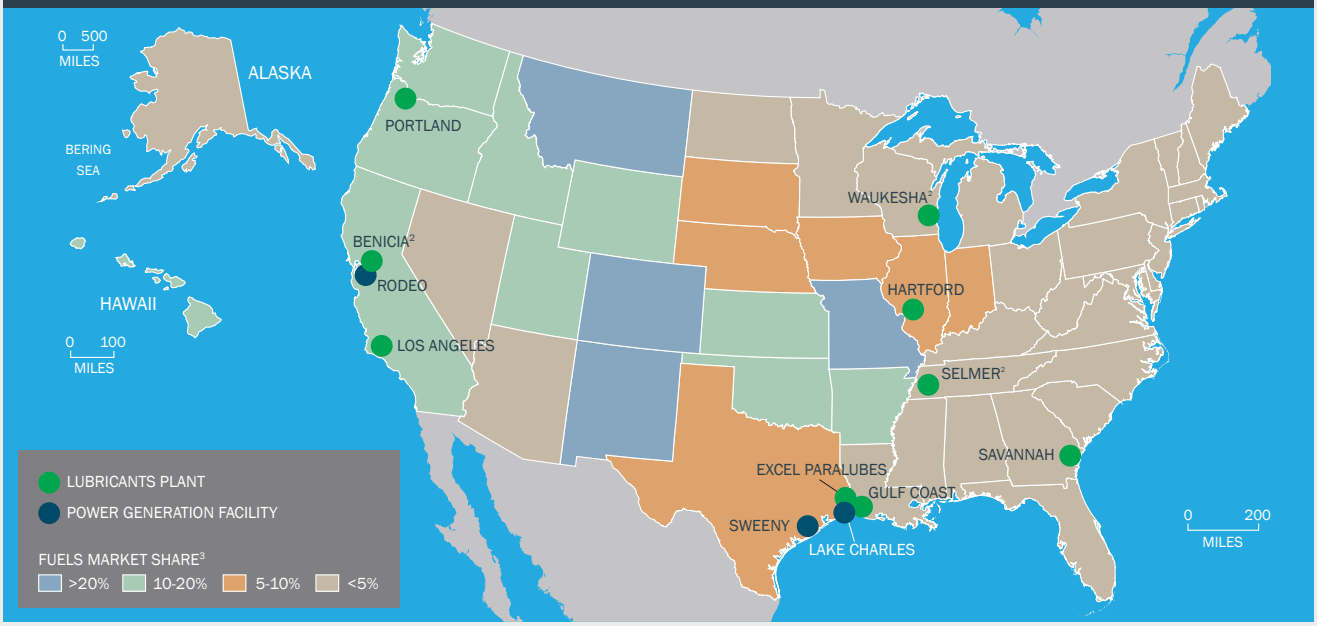






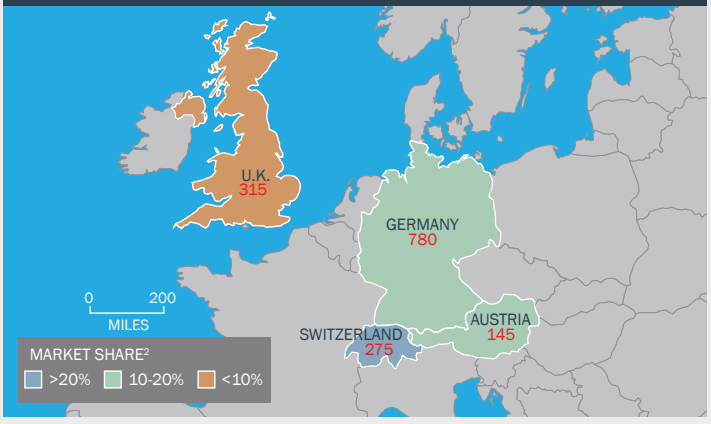
Phillips 66 markets fuels and lubricants under these brands

U.S. MARKETING AND SPECIALTIES[1] AS OF DEC. 31, 2013



[1] As Flow Improvers business was divested in early 2014, its assets are not shown.
[2] Lubricants plants included in Spectrum Corp. acquisition completed in the third quarter of 2014.
[3] Market share based on all Phillips 66 stations as a percentage of total stations in state.

EUROPE MARKETING[1] AS OF DEC. 31, 2013



[1] Map does not include 200 sites with brand licensing agreements.
[2] Market share based on sold fuel volumes.

MARKETING AND SPECIALTIES



POWER GENERATION

In the first quarter of 2014, Phillips 66 increased its ownership interest in the 440-megawatt Sweeny Cogeneration Power Plant to 100 percent by acquiring the remaining 50 percent interest. Phillips 66's Sweeny Refinery and CPChem's Sweeny facility both use steam and power generated by the plant. Excess power is sold into the power commodity market. Our Rodeo Carbon plant has a steam power plant that generates steam and power for on-site use with excess power for sale into the California market. Phillips 66 owns a 37 percent ownership interest in the Nelson Industrial Steam Company that consumes petroleum coke produced by the Lake Charles Refinery. Generated steam is sold to a third party and power is sold to the local utility. In July 2013, we sold the Immingham Combined Heat and Power Plant located in North Lincolnshire, United Kingdom.

SPECIALTIES BUSINESSES

Phillips 66 manufactures and markets specialty products, including petroleum coke products, waxes, solvents and polypropylene, which are sold to commercial, industrial and wholesale buyers worldwide.

Petroleum Coke

Phillips 66 is the largest global producer of needle coke for manufacturing electric arc furnace electrodes, supported by our outstanding manufacturing expertise, technological leadership and rigorous quality control. Our experience in carbon upgrading also supports the supply of green and calcined specialty cokes to the steel, aluminum and titanium dioxide industries in multiple countries from our refineries located in North America and the United Kingdom.



Calcined specialty coke is produced at the Lake Charles Refinery in Louisiana.

Solvents

At the Borger and Sweeny refineries, Phillips 66 manufactures and markets pure-grade specialty solvents, including pentanes, hexanes and heptanes, for use in a variety of industrial and chemical manufacturing applications. These products are marketed globally and used in the production of such products as vegetable oil, automotive tires, foam insulation and adhesives.

Polypropylene

Phillips 66 produces polypropylene resins at its world-scale polypropylene plant adjacent to its Bayway Refinery in Linden, New Jersey. The product is sold under COPYLENE®. The plant is one of the newest and largest polypropylene production units in the northeast United States, with a nameplate capacity of 775 MMLb/Y.



The Phillips 66 lubricants plant in Hartford, Illinois.

LUBRICANTS

Finished Lubricants

Phillips 66 is one of the largest finished lubricants suppliers in the United States. It manufactures and markets four major lubricant brands: Phillips 66®, Conoco®, 76® and Kendall®. The combination of these diverse brands, along with supplying a number of private-label and original-equipment manufacturers in North America, gives Phillips 66 a position in all key lubricants markets. The distribution network consists of marketers, mass merchandise stores, fast lube stores, tire stores and automotive dealers.

In line with the company's strategy to selectively grow its Marketing and Specialties business, Phillips 66 announced in the second quarter of 2014 its intention to acquire Spectrum Corporation, a leading specialty lubricants company. Spectrum is an independent blender, packager and marketer of specialty lubricants including two-cycle engine oil, small engine oil and hydraulic oil. It offers a broad array of private-label and brand-name specialty lubricants and related products, including more than 500 products under 14 separate product lines. The acquisition is expected to increase Phillips 66's access to specialized global lubricants markets and create new opportunities to expand its worldwide Lubricants customer base. The transaction closed in the third quarter of 2014.

Base Oil

The base oil marketing activities of Phillips 66 include the sale of Group II Pure Performance® hydrocracked base oils to an extensive list of customers throughout the world and the purchase of a wide range of base oils from several North American refiners that fulfill the manufacturing needs of the finished lubricants product lines. Base oils are manufactured at the 50-50 joint-venture Excel Paralubes plant in Westlake, Louisiana. Additionally, Phillips 66 has an exclusive agreement with South Korea's S-Oil Corporation to distribute and market their high-viscosity-index Group III Ultra-S® base oils in North America.



An employee at the Los Angeles lubricants plant inspects a product sample.

UNITS OF MEASURE

BCF	Billion cubic feet
BCFD	Billions of cubic feet per day
BLb/Y	Billions of pounds per year
BPD	Barrels per day
BTU	British thermal units
BTUD	British thermal units per day
Lb/MBbl	Pounds per thousand barrels
MBbls	Thousands of barrels
MBD	Thousands of barrels per day
MCFD	Thousands of cubic feet per day
MMBbl	Millions of barrels
MMBD	Millions of barrels per day
MMCFD	Millions of cubic feet per day
MMLb/Y	Millions of pounds per year
TBTU	Trillion British thermal units
TBtu/d	Trillion British thermal units per day

COMMONLY USED ABBREVIATIONS

NGL	Natural gas liquids
ROCE	Return on capital employed
LPG	Liquefied petroleum gas

DATA

Distillate capacity includes aviation fuels. The Nelson Complexity Factor calculation considers the variety and capacity of the different processing units within a refinery. The higher a refinery's factor, the greater its secondary conversion capacity and capability to produce higher-value products.

SAFE HARBOR STATEMENT

This Fact Book contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended, which are intended to be covered by the safe harbors created thereby. Words and phrases such as “is anticipated,” “is estimated,” “is expected,” “is planned,” “is scheduled,” “is targeted,” “believes,” “intends,” “objectives,” “projects,” “strategies” and similar expressions are used to identify such forward-looking statements. However, the absence of these words does not mean that a statement is not forward-looking. Forward-looking statements relating to Phillips 66’s operations (including joint venture operations) are based on management’s expectations, estimates and projections about the company, its interests and the energy industry in general on the date this Fact Book was prepared. These statements are not guarantees of future performance and involve certain risks, uncertainties and assumptions that are difficult to predict. Therefore, actual outcomes and results may differ materially from what is expressed or forecast in such forward-looking statements. Factors that could cause actual results or events to differ materially from those described in the forward-looking statements include fluctuations in crude oil, NGL, and natural gas prices, and refining and petrochemical margins; unexpected changes in costs for constructing, modifying or operating our facilities; unexpected difficulties in manufacturing, refining or transporting our products; lack of, or disruptions in, adequate and reliable transportation for our crude oil, natural gas, NGL, and refined products; potential liability from litigation or for remedial actions, including removal and reclamation obligations under environmental regulations; limited access to capital or significantly higher cost of capital related to illiquidity or uncertainty in the domestic or international financial markets; and other economic, business, competitive and/or regulatory factors affecting Phillips 66’s businesses generally as set forth in our filings with the Securities and Exchange Commission. Phillips 66 is under no obligation (and expressly disclaims any such obligation) to update or alter its forward-looking statements, whether as a result of new information, future events or otherwise.



Phillips 66
P.O. Box 4428
Houston, TX 77210

www.phillips66.com

ABOUT PHILLIPS 66

Built on more than 130 years of experience, Phillips 66 is a growing energy manufacturing and logistics company with high-performing Midstream, Chemicals, Refining, and Marketing and Specialties businesses. This integrated portfolio enables Phillips 66 to capture opportunities in a changing energy landscape. Headquartered in Houston, the company has 13,500 employees who are committed to operating excellence and safety. Phillips 66 had $50 billion of assets as of Dec. 31, 2013. For more information, visit *www.phillips66.com* or follow us on Twitter *@Phillips66Co*.

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CSH-14-0592

South Coast Air Quality Management District

Form 400-A

Application Form for Permit or Plan Approval

List only one piece of equipment or process per form.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

1. Facility Name (Business Name of Operator to Appear on the Permit): Phillips 66 Los Angeles Refinery, Carson Plant

2. Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 171109

3. Owner's Business Name (If different from Business Name of Operator):

Section B - Equipment Location Address

4. Equipment Location Is: (•) Fixed Location ( ) Various Location
(For equipment operated at various locations, provide address of initial site.)

1520 East Sepulveda Boulevard
Street Address

Carson , CA 90745
City Zip

Knut Beruldsen — Contact Name
Env. Engineer — Title
(310) 952-6504 — Phone # — Ext. — Fax #
E-Mail: knut.j.beruldsen@p66.com

Section C - Permit Mailing Address

5. Permit and Correspondence Information:
[ ] Check here if same as equipment location address

1660 West Anaheim Street
Address

Wilmington , CA 90744
City State Zip

Knut Beruldsen — Contact Name
Env. Engineer — Title
(310) 952-6504 — Phone # — Ext. — Fax #
E-Mail: knut.j.beruldsen@p66.com

Section D - Application Type

6. The Facility Is: ( ) Not In RECLAIM or Title V ( ) In RECLAIM ( ) In Title V (•) In RECLAIM & Title V Programs

7. Reason for Submitting Application (Select only ONE):

7a. New Equipment or Process Application:

(•) New Construction (Permit to Construct) (10)
( ) Equipment On-Site But Not Constructed or Operational
( ) Equipment Operating Without A Permit *
( ) Compliance Plan
( ) Registration/Certification
( ) Streamlined Standard Permit

7b. Facility Permits:

( ) Title V Application or Amendment (Refer to Title V Matrix)
( ) RECLAIM Facility Permit Amendment

7c. Equipment or Process with an Existing/Previous Application or Permit:

( ) Administrative Change
( ) Alteration/Modification
( ) Alteration/Modification without Prior Approval *
( ) Change of Condition
( ) Change of Condition without Prior Approval *
( ) Change of Location
( ) Change of Location without Prior Approval *
( ) Equipment Operating with an Expired/Inactive Permit *

Existing or Previous Permit/Application
If you checked any of the items in 7c., you MUST provide an existing Permit or Application Number:

* A Higher Permit Processing Fee and additional Annual Operating Fees (up to 3 full years) may apply (Rule 301(c)(1)(D)(i)).

8a. Estimated Start Date of Construction (mm/dd/yyyy): 06/01/2013

8b. Estimated End Date of Construction (mm/dd/yyyy): 12/01/2015

8c. Estimated Start Date of Operation (mm/dd/yyyy): 12/01/2015

9. Description of Equipment or Reason for Compliance Plan (list applicable rule):
575,000 BBL Crude Oil Storage Tank w/ 6 mixers - Tank 2640

10. For Identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each equipment / process): 1

11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are $500,000 or less OR a not-for-profit training center) (•) No ( ) Yes

12. Has a Notice of Violation (NOV) or a Notice to Comply (NC) been issued for this equipment? (•) No ( ) Yes
If Yes, provide NOV/NC#:

Section E - Facility Business Information

13. What type of business is being conducted at this equipment location? Oil Refinery

14. What is your business primary NAICS Code? (North American Industrial Classification System) 32411

15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? ( ) No (•) Yes

16. Are there any schools (K-12) within 1000 feet of the facility property line? (•) No ( ) Yes

Section F - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application are true and correct.

17. Signature of Responsible Official:

18. Title of Responsible Official: Env. Superintendent

19. I wish to review the permit prior to issuance. (This may cause a delay in the application process.) ( ) No (•) Yes

20. Print Name: Marshall Waller

21. Date: 10/25/12

22. Do you claim confidentiality of data? (If Yes, see instructions.) ( ) No (•) Yes

23. Check List: [X] Authorized Signature/Date [X] Form 400-CEQA [X] Supplemental Form(s) (ie., Form 400-E-xx) [X] Fees Enclosed

AQMD USE ONLY	APPLICATION TRACKING #	CHECK #	AMOUNT RECEIVED	PAYMENT TRACKING #	VALIDATION
	544057	10105	$ 5,160.09	(105188)	11/21/12

DATE	APP REJ	DATE	APP REJ	CLASS	BASIC CONTROL	EQUIPMENT CATEGORY CODE	TEAM	ENGINEER	REASON ACTION TAKEN
				III		2,580.05	C	(105189)	

© South Coast Air Quality Management District, Form 400-A (3/12.07)

2/8/19

10106 5,160.09 (105190) T3-15
10108 1,789.12 (105191)
10109 2,580.05 (105192)
10110 5,160.09 (105193)

2/6

ENGINEERING

12 NOV 27 P3:52

SCAQ[redacted]D PERMIT PROCESSING SYSTEM[redacted]PS)

FEE DATA - SUMMARY SHEET

Application No : **544857**
IRS/SS No:
Previous Application No:
Previous Permit No:

Company Name : **PHILLIPS 66 COMPANY/LOS ANGELES REFINERY**
Facility ID: **171109**
Equipment Street: **1520 E SEPULVEDA BLVD , CARSON CA 90745**
Equipment Desc : **STORAGE TANK-GAS DOME EXT.FLOAT ROOF**

Equipment Type : **BASIC**
Fee Charged by: **B-CAT**
B-CAT NO. : **248919**
C-CAT NO: **00**
Fee Schedule: **C**
Facility Zone : **04**
Deemed Compl. Date: **12/13/2012**
Public Notice: **NO**

Evaluation Type : **PERMIT TO CONSTRUCT (PC)**
Disposition : **Approve PC, Recommended by Engineer**
Lead Appl. No :
Small Business: ☐
Higher Fees for Failing to Obtain a Permit: ☐
Identical Permit Unit: ☒

Air quality Analysis			$0.00	Filing Fee Paid:	$0.00
E.I.R			$0.00	Permit Processing Fee Paid:	$2,580.05
Health Risk Assessment			$0.00	Permit Processing Fee Calculated*:	$1,720.03
Public Notice Preparation Fee			$0.00	Permit Processing Fee Adjustment:	$-860.02
Public Notice Publication Fee			$0.00		
Expedited Processing	Hours:	0.00	$860.02		
Source Test Review	Hours:	0.00	$0.00		
Time & Material	Hours:	0.00	$0.00		
				Total Additional Fee:	$860.02
				Additional Charge:	$0.00

COMMENTS:

RECOMMENDED BY: **JANICE WEST**
DATE: **09/04/2013**

REVIEWED BY:_____
DATE:_____

* ADJUSTED FOR SMALL BUSINESS, IDENTICAL EQUIPMENT AND P/O NO P/C PENALTY

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Tuesday, September 03, 2013 2:05 PM
To: Janice West
Subject: RE: RE: AI Request for crude tanks project

Our Crude buyer calls it AWB crude. It is from Canada. All three of the manifest cars were from the same supplier.

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Tuesday, September 03, 2013 2:02 PM
To: Matthews, John W
Subject: [EXTERNAL]RE: RE: AI Request for crude tanks project

Sorry, I meant geographic origin or other identifier, (similar to California or San Joaquin Valley or Canada), just to identify that column as different and not an average of the others). (Danny was asking for an additional identifier)

From: Matthews, John W [mailto:John.Matthews@p66.com]
Sent: Tuesday, September 03, 2013 1:59 PM
To: Janice West
Subject: RE: RE: AI Request for crude tanks project

The table was for the proposed crude tank. The crude speciation for the manifest cars was based on three discrete vapor samples taken directly from the representative manifest cars currently being received. The results of the individual samples are in the second, third and fourth columns. The labels on the top of those columns are the DOT numbers of the sampled railcars. The vapor samples were analyzed by EPA Method TO-15.

The maximum from these crude vapor samples (the fifth column) were used in the hybrid speciation.

John W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Tuesday, September 03, 2013 11:25 AM
To: Matthews, John W
Subject: [EXTERNAL]FW: RE: AI Request for crude tanks project

Hi John,

In the attached table, there are columns for SJV crude, "crude oils", Cal crude, and crude hybrid. What is the origin of "crude oils"?

Janice

From: Marcia Baverman [mailto:mbaverman@envaudit.com]
Sent: Tuesday, February 05, 2013 1:58 PM
To: Matthews, John W (P66)

Cc: mchoi@envaudit.com
Subject: [EXTERNAL]RE: AI Request for crude tanks project

John –

Attached is the derivation of the "hybrid" speciation used to calculate the emissions in the EPA Tanks 4.0 model. The hybrid speciation is the highest concentration for each TAC from each of the three crude speciations used in the most recent AB2588 HRA. The hybrid speciation allows for only having to run one scenario to determine the TAC emissions for use in the HRA.

Thanks -

Marcia Baverman
Project Manager
714-632-8521 ext. 237
mbaverman@envaudit.com

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From: Matthews, John W (P66) [mailto:John.Matthews@p66.com]
Sent: Tuesday, January 15, 2013 10:24 AM
To: 'MBaverman@EnvAudit.com'
Subject: FW: AI Request for crude tanks project

As discussed.

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Thursday, January 10, 2013 1:49 PM
To: Matthews, John W (P66)
Subject: [EXTERNAL]AI Request for crude tanks project

Hi John,

As I mentioned on the phone, I am requesting additional information in support of your crude tanks applications Please provide the following information:

- Details on the speciation of crude oil (the toxics speciation you used in your TANKS calculations), as well as the origin of this speciation and why you feel it is the worst-case scenario for toxics.
- The true vapor pressure limit you are willing to accept for the operation of these tanks (emissions will be recalculated)
- Fugitive counts for the existing crude tanks (and whether this project will cause any changes—if so, provide pre and post-project counts)
- Information on the impact of the project on the benzene stripper (particularly fugitive counts), and your justification for why an additional application is not needed for that permit unit.

Paul, Tran and I met with Jay yesterday, and after our discussion, Jay instructed me to consider the existing tanks as post-NSR tanks, based on the information in the files, as well as the presence of a throughput limit. I will be re-calculating the baseline emissions using the Tanks program (and the parameters specified in the original permit to operate application), so that the calculation method is the same for pre- and post-project emissions.

Please let me know if you have any comments or questions. I'll wait to proceed until I hear from you.

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Tuesday, September 03, 2013 1:59 PM
To: Janice West
Subject: RE: RE: AI Request for crude tanks project
Attachments: Speciation Data.pdf

The table was for the proposed crude tank. The crude speciation for the manifest cars was based on three discrete vapor samples taken directly from the representative manifest cars currently being received. The results of the individual samples are in the second, third and fourth columns. The labels on the top of those columns are the DOT numbers of the sampled railcars. The vapor samples were analyzed by EPA Method TO-15.

The maximum from these crude vapor samples (the fifth column) were used in the hybrid speciation.

John W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Tuesday, September 03, 2013 11:25 AM
To: Matthews, John W
Subject: [EXTERNAL]FW: RE: AI Request for crude tanks project

Hi John,

In the attached table, there are columns for SJV crude, "crude oils", Cal crude, and crude hybrid. What is the origin of "crude oils"?

Janice

From: Marcia Baverman [mailto:mbaverman@envaudit.com]
Sent: Tuesday, February 05, 2013 1:58 PM
To: Matthews, John W (P66)
Cc: mchoi@envaudit.com
Subject: [EXTERNAL]RE: AI Request for crude tanks project

John –

Attached is the derivation of the "hybrid" speciation used to calculate the emissions in the EPA Tanks 4.0 model. The hybrid speciation is the highest concentration for each TAC from each of the three crude speciations used in the most recent AB2588 HRA. The hybrid speciation allows for only having to run one scenario to determine the TAC emissions for use in the HRA.

Thanks -

Marcia Baverman
Project Manager
714-632-8521 ext. 237
mbaverman@envaudit.com

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From: Matthews, John W (P66) [mailto:John.Matthews@p66.com]
Sent: Tuesday, January 15, 2013 10:24 AM
To: 'MBaverman@EnvAudit.com'
Subject: FW: AI Request for crude tanks project

As discussed.

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Thursday, January 10, 2013 1:49 PM
To: Matthews, John W (P66)
Subject: [EXTERNAL]AI Request for crude tanks project

Hi John,

As I mentioned on the phone, I am requesting additional information in support of your crude tanks applications Please provide the following information:

- Details on the speciation of crude oil (the toxics speciation you used in your TANKS calculations), as well as the origin of this speciation and why you feel it is the worst-case scenario for toxics.
- The true vapor pressure limit you are willing to accept for the operation of these tanks (emissions will be recalculated)
- Fugitive counts for the existing crude tanks (and whether this project will cause any changes—if so, provide pre and post-project counts)
- Information on the impact of the project on the benzene stripper (particularly fugitive counts), and your justification for why an additional application is not needed for that permit unit.

Paul, Tran and I met with Jay yesterday, and after our discussion, Jay instructed me to consider the existing tanks as post-NSR tanks, based on the information in the files, as well as the presence of a throughput limit. I will be re-calculating the baseline emissions using the Tanks program (and the parameters specified in the original permit to operate application), so that the calculation method is the same for pre- and post-project emissions.

Please let me know if you have any comments or questions. I'll wait to proceed until I hear from you.

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Phillips 66 Company
Los Angeles Refinery - Carson Plant
Toxic Fugitive Emission Speciation for Rail Modification

CONSTITUENT	ACFX71711	PPRX28550	ACFX73301	MAXIMUM	PERCENT	MW	Concentration		Emission Rate
	PPB (V/V)	PPB (V/V)	PPB (V/V)	PPB (V/V)	% (V/V)	g/mole	g/l	Wt. %	#/hr.
1,2,4-Trimethylbenzene	ND	1800	ND	1800	0.0002%	120	9.6E-06	0.005%	6.3E-06
1,3,5-Trimethylbenzene	ND	980	ND	980	0.0001%	120	5.3E-06	0.003%	3.4E-06
2,2,4-Trimethyl Pentane	49000	4800	25000	49000	0.005%	114	2.5E-04	0.13%	1.6E-04
4-Ethyltoluene	ND	550	ND	550	0.00006%	120	2.9E-06	0.0016%	1.9E-06
Benzene	930000	32000	690000	930000	0.093%	78	3.2E-03	1.74%	2.1E-03
Butane	31000000	660000	21000000	31000000	3.1%	58	8.0E-02	43.1%	5.2E-02
Cyclohexane	1900000	65000	1500000	1900000	0.19%	84	7.1E-03	3.8%	4.7E-03
Ethylbenzene	ND	2400	ND	2400	0.0002%	106	1.1E-05	0.006%	7.4E-06
Heptane	1200000	79000	790000	1200000	0.12%	100	5.4E-03	2.9%	3.5E-03
Hexane	16000000	220000	9800000	16000000	1.6%	86	6.1E-02	33.0%	4.0E-02
Isobutane	4700000	190000	2900000	4700000	0.47%	58	1.2E-02	6.5%	7.9E-03
o-Xylene	ND	3300	ND	3300	0.0003%	106	1.6E-05	0.008%	1.0E-05
p/m-Xylene	ND	12000	ND	12000	0.0012%	106	5.7E-05	0.03%	3.7E-05
Propane	7800000	780000	5900000	7800000	0.78%	44	1.5E-02	8.2%	1.0E-02
Toluene	240000	20000	190000	240000	0.024%	92	9.9E-04	0.5%	6.4E-04
TOTALS							1.9E-01		1.2E-01
Fugitive Emissions (#/hr.)	1.2E-01						Total Xylenes		4.7E-05

CONFIDENTIAL BUSINESS INFORMATION

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Friday, July 19, 2013 2:33 PM
To: Janice West
Subject: RE: PRVs in tank system

All of the relief valves are on sampling loops. If the block valve is open and the sampling valve is closed, the relief valve will return the material to the main process line if the set point is exceeded. None of them vent to atmosphere.

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Thursday, July 18, 2013 10:53 AM
To: Matthews, John W
Subject: [EXTERNAL]PRVs in tank system

Hi John,

I have a question on the six PRVs associated with Tank 2640: are they connected to the vapor recovery system or fitted with rupture disks?

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Wednesday, July 17, 2013 12:25 PM
To: Janice West
Subject: FW: RE: leg size on Tank 2643

The legs for Tank 2643 are indeed 4" diameter.

From: Michael Choi [mailto:mchoi@envaudit.com]
Sent: Wednesday, July 17, 2013 12:24 PM
To: Matthews, John W; "Marcia Baverman"
Subject: [EXTERNAL]RE: leg size on Tank 2643

Yes. The emissions have been adjusted to reflect the 4" diameters.

From: Matthews, John W [mailto:John.Matthews@p66.com]
Sent: Wednesday, July 17, 2013 12:19 PM
To: 'Marcia Baverman' (mbaverman@envaudit.com)
Cc: 'mchoi@envaudit.com'
Subject: FW: leg size on Tank 2643

I assume the legs are still 4", correct?

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Wednesday, July 17, 2013 11:29 AM
To: Matthews, John W
Subject: [EXTERNAL]leg size on Tank 2643

Hi John,

I noticed that in the most recent CEQA revision, it appeared that TANKS calculations were done only for the standard 3" legs. Was there a change to the leg size for Tank 2643? The most recent info I was provided described 4" legs and had two TANKS runs: legs and legless.

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

No virus found in this message.
Checked by AVG - www.avg.com
Version: 2013.0.3349 / Virus Database: 3204/6498 - Release Date: 07/17/13

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Monday, July 15, 2013 7:04 AM
To: Janice West
Subject: RE: CEQA tank capacity

I was told that the 615,000 and 14,000 bbl capacities will be the values on the tank nameplates. I believe those are the values usually put on the permits to make it easier for inspectors to verify the tank description. Based on that information, those values should be used in the permit descriptions for Tanks 2640 and 2643, respectively.

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Friday, July 12, 2013 4:31 PM
To: Matthews, John W
Subject: [EXTERNAL]RE: CEQA tank capacity

(btw, the water draw tank was also modified from 11,500 bbl to 14,000 bbl nominal capacity – but again with no change to working capacity). Should the equipment description be changed for this as well?

From: Janice West
Sent: Friday, July 12, 2013 4:29 PM
To: 'Matthews, John W'
Subject: CEQA tank capacity

Hi John,

I noted in the revised CEQA document that the Tank 2640 capacity is now listed as 615,000 bbl nominal capacity (it was previously listed as 575,000 bbl, and that is the number I've proposed in the permit equipment description).

The working capacity (on which the emissions are based) is still 500,000 bbl, so that isn't a concern, but is this a change that should also be made to the permit equipment description (615,000 bbl capacity)?

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Janice West

From: Michael Choi [mchoi@envaudit.com]
Sent: Tuesday, June 18, 2013 1:07 PM
To: Janice West
Cc: John.Matthews@p66.com; environmentalauditinc.com, mbaverman
Subject: 2778 - P66 - Crude Oil Storage Capacity Project Fugitve Speciation
Attachments: speciations.pdf

Janice,

As discussed this morning, the fugitive emissions for the components are based on a hybrid speciation of vapor fractions from the existing crude and the Canadian crude speciations. The vapor fractions from the existing crude speciation are from the current AB2588 HRA. The vapor fractions for the Canadian crude were calculated using the following formula:

Vapor wt fraction of x = Liquid wt% / 100 / Liquid MW of x * Liquid MW of Crude * Vapor Pressure of x / Ambient Vapor Pressure * Vapor MW of x / Vapor MW of Crude

The hybrid speciation is a combination of the maximum value of each individual chemical regardless of phase or profile. For example, the hexane liquid wt% of the Canadian crude speciation was higher than the AB2588 value, however, the liquid wt% of the AB2588 speciation was higher than the Canadian crude value. Therefore the Canadian crude value was used for the hybrid liquid speciation (TANKS), and the AB2588 value was used for the hybrid vapor speciation (components). This method creates a very conservative speciation for both liquid and vapor phases. I have attached the speciation chart from the HRA for your convenience.

Please contact me if you have any further questions or comments.

Best Regards,

Michael Choi
Air Quality Specialist | Environmental Audit, Inc.
714.632.8521 x 227 | mchoi@envaudit.com

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Attachment B
Emissions Calculations

Philips 66 Carson Plant
Crude Speciation

Exisitng Crude Speciation

Chemical	Crude Liquid Wt%	Crude Vapor Wt%
Benzene	0.14	2.83
PACs (Chrysene)	0.00	0.00
Cresol (mixed isomers)	0.00	0.00
Ethylbenzene	0.15	0.13
n-Hexane	0.89	38.55
Naphthalene	0.09	0.00
Phenol	0.00	0.00
Toluene	0.58	1.01
Xylene (mixed isomers)	0.94	0.19
Cumene	0.00	0.00
Cyclohexane	0.74	19.14
1,2,4-Trimethylbenzene	0.28	0.01

Canadian Crude Speciation

Component	wt% liquid	ppm liquid	Molecular Weight	Vapor Pressure (mm Hg)	Vapor Pressure (psi)	wt fraction vapor	wt % vapor
Benzene	0.12	1200.00	78.11	95.2	1.8408824	2.02E-04	0.0202
Ethylbenzene	0.041	410.00	106.17	9.53	0.1842816	6.90E-06	0.0007
Hexane	0.96	9600.00	86.18	150	2.90055	2.54E-03	0.2542
Toluene	0.23	2300.00	92.4	28.4	0.5491708	1.15E-04	0.0115
Xylene	0.207	2070.00	106.16	6.72	0.1299446	2.46E-05	0.0025

Hybrid Speciation

Chemical	Crude Liquid Wt%	Crude Vapor Wt%
Benzene	0.14	2.83
PACs (Chrysene)	0.00	0.00
Cresol (mixed isomers)	0.00	0.00
Ethylbenzene	0.15	0.13
n-Hexane	0.96	38.55
Naphthalene	0.09	0.00
Phenol	0.00	0.00
Toluene	0.58	1.01
Xylene (mixed isomers)	0.94	0.19
Cumene	0.00	0.00
Cyclohexane	0.74	19.14
1,2,4-Trimethylbenzene	0.28	0.01

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Monday, June 03, 2013 10:21 AM
To: Michael Krause
Cc: Barbara Radlein; Janice West; Tran Vo; Marshall Waller; 'dstevens@envaudit.com'
Subject: Letter Requesting Expedited CEQA Review and USEPA Region IX Draft Permit Review
Attachments: CEQA Letter.pdf

Attached is the letter requested by Barbara Radlein to document Phillips 66 Company's desire to honor the verbal commitment made by Environmental Audit on our behalf for expedited review of the draft Negative Declaration for the Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project.

As described in the attached letter, we are also requesting that the USEPA review of the draft Title V permit be expedited.

We appreciate the District's efforts to expedite the permitting process for this project. Delays have already impacted our 2013 capital expenditure budget for the Los Angeles Refinery. We and our consultant are dedicated to responding to your information needs and comments as quickly as possible.

If you need something regarding this project, do not hesitate to contact me directly.

John W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

Phillips 66
Los Angeles Refinery - Carson Plant
1520 E. Sepulveda Blvd.
Carson, California 90745
P. O. Box 6206
Carson, California 90747
Telephone 310-522-9300
www.phillips66.com

Via e-mail Delivery

June 3, 2013

ATTN: Mike Krause, Program Supervisor
CEQA Section
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-0944

PHILLPS 66 COMPANY LOS ANGELES REFINERY CARSON PLANT -
CRUDE OIL STORAGE CAPACITY PROJECT
REQUEST FOR EXPEDITED CEQA REVIEW AND USEPA REGION IX PERMIT REVIEW

This letter is to confirm the prior verbal commitment made by our consultant, Environmental Audit, on our behalf with respect to the expedited CEQA review for the draft negative declaration for the referenced project. Phillips 66 Company previously requested expedited review of the permit applications pertaining to the referenced project by submitting SCAQMD form 400-XPP with A/Ns: 544858 – 544861.

The initial draft negative declaration was submitted on November 28, 2012, and the current revised version was submitted in March of 2013. Phillips 66 Company requests that SCAQMD expedite the CEQA review in accordance with SCAQMD Rule 301(u)(2).

In addition to requesting expedited review for the draft negative declaration and the permit application, Phillips 66 requests expedited review by USEPA Region IX for the draft permit.

The information contained in this letter is considered confidential business information. If there are any questions, please contact Marshall Waller at (310) 952-6120 or John Matthews at (310) 952-6213.

Sincerely,

Marshall G. Waller
Environmental Superintendent

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Friday, May 24, 2013 12:31 PM
To: Janice West
Subject: RE: existing tank seals
Attachments: draft permit _crude tanks P66 Comments.doc

I have redlined the draft permit based on the best available information from the design team. Please see the attachment.

John W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Tuesday, May 21, 2013 5:02 PM
To: Matthews, John W
Subject: [EXTERNAL]existing tank seals

Hi John,

I reviewed the tank seals with Paul, and since BACT is not required for the modified tanks, no seal upgrade is necessary. See below revised draft descriptions.

ORAGE TANK, DOMED EXTERNAL FLOATING ROOF, NO. R-510, CRUDE OIL, WELDED, WITH TWO MIXERS, 320000 BBL; DIAMETER: 218 F
:IGHT: 50 FT WITH
N: ~~535286~~ 544860

DOME COVER, GEODESIC

FLOATING ROOF, PONTOON~~, WELDED SHELL~~

MARY SEAL, CATEGORY A, MECHANICAL ~~METALLIC~~ SHOE

SECONDARY SEAL, SHOE MOUNTED, CATEGORY B OR BETTER, WIPER TYPE

GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED

ORAGE TANK, DOMED EXTERNAL FLOATING ROOF, NO. R-511, CRUDE OIL, WELDED, WITH TWO MIXERS, 320000 BBL; DIAMETER: 218 F
:IGHT: 50 FT WITH
N: ~~535287~~ 544861

DOME COVER, GEODESIC

FLOATING ROOF, PONTOON

PRIMARY SEAL, CATEGORY A, MECHANICAL ~~METALLIC~~ SHOE

SECONDARY SEAL, SHOE MOUNTED, CATEGORY B OR BETTER, WIPER TYPE

GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED

From: Matthews, John W [mailto:John.Matthews@p66.com]
Sent: Tuesday, May 21, 2013 9:16 AM
To: Janice West
Subject: RE: crude analyses

Attached is a comparison of the results of the Canadian Crude Speciation vs. the speciation used in the submitted calculations. Only n-hexane was detected at a slightly higher concentration. There will be no significant impact on the HRA results, but we will be submitting revised calculations based on the higher n-hexane concentration no later than tomorrow.

The results seam to confirm our position that the speciation that was used is reasonably conservative.

John W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Thursday, May 16, 2013 10:44 AM
To: Matthews, John W
Subject: [EXTERNAL]crude analyses

Hi John,

I told Paul about your plans, and he mentioned that if you currently have other types of crude on hand, a more recent analysis of a non-Canadian crude (in addition to your planned analysis) would provide a better comparison of the relative HAP concentration of your crude slate. Either refuting or confirming the claim that Canadian crudes have more HAPs. Since you're doing analyses anyway...

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Equipment	ID No.	Conn To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
Process 10 : STORAGE TANKS					P13.2
System 7 : DOMED EXTERNAL FLOATING ROOF TANKS					
STORAGE TANK, DOMED EXTERNAL FLOATING ROOF, NO. 2640, CRUDE OIL, WELDED SHELL WITH FOUR MIXERS, ~~563593~~ BBL; DIAMETER: 260 FT; HEIGHT: 65 FT WITH A/N: 544857 DOME COVER, GEODESIC FLOATING ROOF, PONTOON PRIMARY SEAL, CATEGORY A METALLIC SHOE SECONDARY SEAL, CATEGORY A, RIM MOUNTED GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED	Deee			HAP: (10) [40CFR 63 Subpart CC, #3A, 6-23-2003]	C1.xb, E193.x, H23.17
STORAGE TANK, DOMED EXTERNAL FLOATING ROOF, NO. 2643, CRUDE/WATER, WELDED SHELL, ~~2069~~ BBL; DIAMETER: 44 FT; HEIGHT: 51 FT 7 IN WITH A/N: 544859 DOME COVER, GEODESIC FLOATING ROOF, DOUBLE DECK PRIMARY SEAL, CATEGORY A METALLIC SHOE SECONDARY SEAL, CATEGORY A, RIM MOUNTED GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED	Dddd			HAP: (10) [40CFR 63 Subpart CC, #2, 6-23-2003]	C1.xc, E193.x, H23.17
STORAGE TANK, DOMED EXTERNAL FLOATING ROOF, NO. R-510, CRUDE OIL, WELDED, WITH TWO MIXERS, 320000 BBL; DIAMETER: 218 FT; HEIGHT: 50 FT WITH A/N: ~~535286~~ 544860 DOME COVER, GEODESIC FLOATING ROOF, PONTOON, ~~WELDED SHELL~~ PRIMARY SEAL, CATEGORY A, MECHANICAL ~~METALLIC~~ SHOE SECONDARY SEAL, SHOE MOUNTED, CATEGORY B OR BETTER, WIPER TYPE GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED	D394			HAP: (10) [40CFR 63 Subpart CC, #2, 6-23-2003]	C1.xa, ~~C1.17~~, E193.x, H23.4
STORAGE TANK, DOMED EXTERNAL FLOATING ROOF, NO. R-511, CRUDE OIL, WELDED, WITH TWO MIXERS, 320000 BBL; DIAMETER: 218 FT; HEIGHT: 50 FT WITH	D395			HAP: (10) [40CFR 63 Subpart CC, #2, 6-23-2003]	C1.xa, ~~C1.17~~, E193.x, H23.4

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Equipment	ID No.	Conn To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
A/N: ~~535287~~ 544861 DOME COVER, GEODESIC FLOATING ROOF, PONTOON PRIMARY SEAL, CATEGORY A, MECHANICAL ~~METALLIC~~ SHOE SECONDARY SEAL, SHOE MOUNTED, CATEGORY B OR BETTER, WIPER TYPE GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED					

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CONDITIONS

PROCESS CONDITIONS

P13.2 All devices under this process are subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
Benzene	40CFR61, SUBPART	FF

[40CFR 61 Subpart FF, 12-4-2003]

[Processes subject to this condition : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]

SYSTEM CONDITIONS

DEVICE CONDITIONS

~~C1.17 The operator shall limit the throughput to no more than 4.5625e+06 barrel(s) in any one year.~~

~~[RULE 1303(b)(2) Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]~~

~~[Devices subject to this condition : D394, D395]~~

C1.xa The operator shall limit the throughput to no more than 1.52 e+06 barrel(s) in any one calendar month.

The operator shall comply with the following throughput measurement practices.

The operator shall calculate the throughput, in barrels, by the following equation: 0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The ATLG installed shall be verified once per quarter by comparing against a manual tank level measurement. If the ATLG differs from the manual tank level measurement by more than 1.0 inch or 0.8%, whichever is greater, the ATLG shall be repaired and put back into service within 10 days. While the ATLG is being repaired, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to the discovery of the discrepancy.

In the event of a failure or routine maintenance of the ATLG, the ATLG shall be repaired (if necessary) and put back into service within 10 days of the time that the ATLG failed or was removed from service for maintenance. While the ATLG is being repaired or maintained, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to time that the ATLG went out of service.

The operator shall keep adequate records to show compliance with the limitations specified in this permit. Such records shall be maintained and kept on file for at least two years and shall be made available to the executive officer or his authorized representative upon request.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D394, D395]

C1.xb The operator shall limit the throughput to no more than 2.5 e+06 barrel(s) in any one calendar month.

The operator shall comply with the following throughput measurement practices.

The operator shall calculate the throughput, in barrels, by the following equation: 0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The ATLG installed shall be verified once per quarter by comparing against a manual tank level measurement. If the ATLG differs from the manual tank level measurement by more than 1.0 inch or 0.8%, whichever is greater, the ATLG shall be repaired and put back into service within 10 days. While the ATLG is being repaired, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to the discovery of the discrepancy.

In the event of a failure or routine maintenance of the ATLG, the ATLG shall be repaired (if necessary) and put back into service within 10 days of the time that the ATLG failed or was

removed from service for maintenance. While the ATLG is being repaired or maintained, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to time that the ATLG went out of service.

The operator shall keep adequate records to show compliance with the limitations specified in this permit. Such records shall be maintained and kept on file for at least two years and shall be made available to the executive officer or his authorized representative upon request.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : Dccc]

C1.xc The operator shall limit the throughput to no more than 64,000 barrel(s) in any one calendar month.

The operator shall comply with the following throughput measurement practices.

The operator shall calculate the throughput, in barrels, by the following equation: 0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The ATLG installed shall be verified once per quarter by comparing against a manual tank level measurement. If the ATLG differs from the manual tank level measurement by more than 1.0 inch or 0.8%, whichever is greater, the ATLG shall be repaired and put back into service within 10 days. While the ATLG is being repaired, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to the discovery of the discrepancy.

In the event of a failure or routine maintenance of the ATLG, the ATLG shall be repaired (if necessary) and put back into service within 10 days of the time that the ATLG failed or was removed from service for maintenance. While the ATLG is being repaired or maintained, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to time that the ATLG went out of service.

The operator shall keep adequate records to show compliance with the limitations specified in this permit. Such records shall be maintained and kept on file for at least two years and shall be made available to the executive officer or his authorized representative upon request.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : Dddd]

E193.x The operator shall install this equipment according to the following specifications:

The operator shall not use this equipment with materials having a Reid vapor pressure of 11

psia or greater.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : Dccc, Dddd, D394, D395]

H23.4 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1149
VOC	40CFR60, SUBPART	K

[RULE 1149, 7-14-1995; RULE 1149, 5-2-2008; **40CFR 60 Subpart K, 10-17-2000]**

[Devices subject to this condition : D394, D395, D396, D397]

H23.17 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1149
VOC	40CFR60, SUBPART	Kb

[RULE 1149, 7-14-1995; RULE 1149, 5-2-2008; **40CFR 60 Subpart Kb, 10-15-2003]**

[Devices subject to this condition : Dccc, Dddd]

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Thursday, May 23, 2013 1:46 PM
To: Janice West
Subject: FW: 2778 - Canadian Crude 1401 Revisions
Attachments: 2778 - Canadian Crude Emissions Tables.pdf; T2643 - Rule1401_Excel2007_Sep1010.pdf; T2640 - Rule1401_Excel2007_Sep1010.pdf; T511 - Rule1401_Excel2007_Sep1010.pdf; T510 - Rule1401_Excel2007_Sep1010.pdf

Attached are the modified calculations reflecting the minor increase in n-hexane liquid concentration from 0.89 to 0.96 wt %.

From: Michael Choi [mailto:mchoi@envaudit.com]
Sent: Thursday, May 23, 2013 1:34 PM
To: Matthews, John W
Cc: 'Marcia Baverman'
Subject: [EXTERNAL]2778 - Canadian Crude 1401 Revisions

[redacted]hn,

Attached are the calculations and Rule 1401 analyses for the tanks for the Crude Capacity Project. I am currently working through Archimedes' comments and will forward the results when I complete the review.

Please contact me if you have any further questions or comments.

Best Regards,

Michael Choi
Air Quality Specialist | Environmental Audit, Inc.
714.632.8521 x 227 | mchoi@envaudit.com

The information in this email, and any attachments, may contain confidential information and is intended solely for the attention and use of the named addressee(s). It must not be disclosed to any person(s) without authorization. If you are not the intended recipient, or a person responsible for delivering it to the intended [redacted]ecipient, you are not authorized to, and must not, disclose, copy, distribute, or retain this message or any part of it. If you have received this communication in error, please notify the sender immediately.

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Crude Speciation

Exisitng Crude Speciation

Chemical	Crude Liquid Wt%	Crude Vapor Wt%
Benzene	0.14	2.83
PACs (Chrysene)	0.00	0.00
Cresol (mixed isomers)	0.00	0.00
Ethylbenzene	0.15	0.13
n-Hexane	0.89	38.55
Naphthalene	0.09	0.00
Phenol	0.00	0.00
Toluene	0.58	1.01
Xylene (mixed isomers)	0.94	0.19
Cumene	0.00	0.00
Cyclohexane	0.74	19.14
1,2,4-Trimethylbenzene	0.28	0.01

Canadian Crude Speciation

Component	wt% liquid	ppm liquid	Molecular Weight	Vapor Pressure (mm Hg)	Vapor Pressure (psi)	wt fraction vapor	wt % vapor
Benzene	1.20E-01	1200.00	78.11	95.2	1.8408824	2.02E-04	2.02E-02
Ethylbenzene	4.10E-02	410.00	106.17	9.53	0.1842816	6.90E-06	6.90E-04
Hexane	9.60E-01	9600.00	86.18	150	2.90055	2.54E-03	2.54E-01
Toluene	2.30E-01	2300.00	92.4	28.4	0.5491708	1.15E-04	1.15E-02
Xylene	2.07E-01	2070.00	106.16	6.72	0.1299446	2.46E-05	2.46E-03

Hybrid Speciation

Chemical	Crude Liquid Wt%	Crude Vapor Wt%
Benzene	0.14	2.83
PACs (Chrysene)	0.00	0.00
Cresol (mixed isomers)	0.00	0.00
Ethylbenzene	0.15	0.13
n-Hexane	0.96	38.55
Naphthalene	0.09	0.00
Phenol	0.00	0.00
Toluene	0.58	1.01
Xylene (mixed isomers)	0.94	0.19
Cumene	0.00	0.00
Cyclohexane	0.74	19.14
1,2,4-Trimethylbenzene	0.28	0.01

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Fugitive Component Emissions

		Tank 2640			Tank 2643		
Chemical	Crude Vapor Wt%	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	2.83	7.44E+01	0.20	8.50E-03	19.33	0.05	2.21E-03
PACs (Chrysene)	0.00	3.56E-05	0.00	4.06E-09	9.24E-06	0.00	1.06E-09
Cresol (mixed isomers)	0.00	4.28E-05	0.00	4.89E-09	1.11E-05	0.00	1.27E-09
Ethylbenzene	0.13	3.29E+00	0.01	3.76E-04	8.55E-01	0.00	9.76E-05
n-Hexane	38.55	1012.95	2.78	1.16E-01	262.96	0.72	3.00E-02
Naphthalene	0.00	2.26E-02	0.00	2.58E-06	5.87E-03	0.00	6.71E-07
Phenol	0.00	1.02E-04	0.00	1.16E-08	2.64E-05	0.00	3.01E-09
Toluene	1.01	2.66E+01	0.07	3.04E-03	6.90	0.02	7.88E-04
Xylene (mixed isomers)	0.19	5.09E+00	0.01	5.81E-04	1.32E+00	0.00	1.51E-04
Cumene	0.00	7.03E-03	0.00	8.02E-07	0.00	0.00	2.08E-07
Cyclohexane	19.14	503.08	1.38	5.74E-02	130.60	0.36	1.49E-02
1,2,4-Trimethylbenzene	0.01	3.28E-01	0.00	3.74E-05	8.51E-02	0.00	9.71E-06
Total VOC	100.00	2.63E+03	7.20	3.00E-01	682.18	1.87	7.79E-02

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Tank Working Loss Emissions

	Tank 2640[1]			Tank 2643[1]			Tank R510/R511		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	8.28	0.0227	9.45E-04	1.66	0.0045	1.89E-04	6.96	0.0191	7.945E-04
PACs (Chrysene)	0.09	0.0002	1.03E-05	0.01	0.0000	1.14E-06	0.07	0.0002	7.991E-06
Cresol (mixed isomers)	0.03	0.0001	3.42E-06	-	-	0.00E+00	0.02	0.0001	2.283E-06
Ethylbenzene	7.10	0.0194	8.10E-04	1.11	0.0030	1.27E-04	5.17	0.0142	5.902E-04
n-Hexane	63.43	0.1738	7.24E-03	13.97	0.0383	1.59E-03	56.90	0.1559	6.495E-03
Naphthalene	4.24	0.0116	4.84E-04	0.64	0.0018	7.31E-05	3.03	0.0083	3.459E-04
Phenol	0.01	0.0000	1.14E-06	-	-	0.00E+00	0.01	0.0000	1.142E-06
Toluene	28.79	0.0789	3.29E-03	4.83	0.0132	5.51E-04	21.79	0.0597	2.487E-03
Xylene (mixed isomers)	44.70	0.1225	5.10E-03	6.98	0.0191	7.96E-04	32.47	0.0890	3.707E-03
Cumene	0.12	0.0003	1.37E-05	0.02	0.0001	2.28E-06	0.08	0.0002	9.132E-06
Cyclohexane	42.75	0.1171	4.88E-03	8.42	0.0231	9.61E-04	35.69	0.0978	4.074E-03
1,2,4-Trimethylbenzene	13.09	0.0359	1.49E-03	2.00	0.0055	2.29E-04	9.39	0.0257	1.072E-03
Total VOC	6,634.36	18.1763	7.57E-01	1,465.21	4.0143	1.67E-01	5963.21	16.3376	6.807E-01

(1) Tank leg emissions scaled for 4" legs.

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Total Tank Operational Emissions

	Tank 2640			Tank 2643		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	82.72	0.2266	0.0094	20.98	0.0575	0.0024
PACs (Chrysene)	0.09	0.0002	0.0000	0.01	0.0000	0.0000
Cresol (mixed isomers)	0.03	0.0001	0.0000	0.00	0.0000	0.0000
Ethylbenzene	10.39	0.0285	0.0012	1.96	0.0054	0.0002
n-Hexane	1,076.38	2.9490	0.1229	276.93	0.7587	0.0316
Naphthalene	4.26	0.0117	0.0005	0.65	0.0018	0.0001
Phenol	0.01	0.0000	0.0000	0.00	0.0000	0.0000
Toluene	55.38	0.1517	0.0063	11.73	0.0321	0.0013
Xylene (mixed isomers)	49.79	0.1364	0.0057	8.30	0.0227	0.0009
Cumene	0.13	0.0003	0.0000	0.02	0.0001	0.0000
Cyclohexane	545.83	1.4954	0.0623	139.02	0.3809	0.0159
1,2,4-Trimethylbenzene	13.42	0.0368	0.0015	2.09	0.0057	0.0002
Total VOC	9,262.19	25.3759	1.0573	2,147.39	5.8833	0.2451

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	T2643
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	48	feet
Area (For Volume Source Only)	3000	ft^2
Distance-Residential	700	meters
Distance-Commercial	125	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (NO = Tier 1 or Tier 2; YES = Tier 3)	NO	

[redacted]ission Units	lb/hr	
[redacted]rce output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0 1	lbs/hr
B1	Benzene (including benzene from gasoline)	2.40E-03	78.11	0.002395315		0.002395315
P15	Chrysene	1.14E-06	228.2928	1.14261E-06		1.14261E-06
C30	Cresol mixtures	1.27E-09	108.14	1.26964E-09		1.26964E-09
E4	Ethyl benzene	2.24E-04	106.16	0.000224312		0.000224312
H8	Hexane (n-)	3.16E-02	86.18	0.03161295		0.03161295
P30	Naphthalene	7.37E-05	128.1732	7.37299E-05		7.37299E-05
P3	Phenol	3.01E-09	94.11	3.00957E-09		3.00957E-09
T3	Toluene (methyl benzene)	1.34E-03	92.13	0.001339019		0.001339019
X1	Xylenes (isomers and mixtures)	9.47E-04	106.2	0.000947268		0.000947268
				0		
[redacted]				0		
				0		
				0		

TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	T2643
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors table:

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.282	16.48
Commercial	4.8075	180

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	2.40E-03	2.40E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	1.14E-06	1.14E-06	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	1.27E-09	1.27E-09		1	1	1	1.0000	600	
Ethyl benzene	2.24E-04	2.24E-04	8.70E-03	1	1	1	1	2000	
Hexane (n-)	3.16E-02	3.16E-02		1.0000	1.0000	1	1	7000	
Naphthalene	7.37E-05	7.37E-05	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	3.01E-09	3.01E-09		1	1	1	1	200	5800
Toluene (methyl benzene)	1.34E-03	1.34E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	9.47E-04	9.47E-04		1.0000	1.0000	1	1	700	22000

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	2.40E-03	2.40E-03	20.9254723	0.010462736
Chrysene	1.14E-06	1.14E-06	0.00998182	4.99091E-06
Cresol mixtures	1.27E-09	1.27E-09	1.1092E-05	5.5458E-09
Ethyl benzene	2.24E-04	2.24E-04	1.95959053	0.000979795
Hexane (n-)	3.16E-02	3.16E-02	276.170733	0.138085367
Naphthalene	7.37E-05	7.37E-05	0.64410439	0.000322052
Phenol	3.01E-09	3.01E-09	2.6292E-05	1.31458E-08
Toluene (methyl benzene)	1.34E-03	1.34E-03	11.6976695	0.005848835
Xylenes (isomers and mixtures)	9.47E-04	9.47E-04	8.27533062	0.004137665
Total	3.66E-02	3.66E-02	3.20E+02	1.60E-01

A/N: T2643 **Application deemed complete date:** 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	8.47E-08	2.82E-07
Chrysene	4.69E-10	7.67E-10
Cresol mixtures		
Ethyl benzene	6.90E-10	2.30E-09
Hexane (n-)		
Naphthalene	3.13E-09	1.04E-08
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**8.90E-08**	**2.95E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		2.33E-06	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		3.13E-10	Pass	Pass
Developmental - DEV	3.38E-04	9.25E-04	Pass	Pass
Endocrine system - END		2.33E-06	Pass	Pass
Eye	1.43E-05		Pass	Pass
Hematopoietic system - HEM	3.32E-04	8.30E-04	Pass	Pass
Immune system - IMM	3.32E-04		Pass	Pass
Kidney - KID		2.33E-06	Pass	Pass
Nervous system - NS	6.51E-06	1.04E-03	Pass	Pass
Reproductive system - REP	3.38E-04		Pass	Pass
Respiratory system - RES	1.43E-05	2.91E-04	Pass	Pass
Skin			Pass	Pass

A/N: T2643 **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			3.04E-05		3.04E-05	3.04E-05		3.04E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				8.55E-12					8.55E-12	
Toluene (methyl benzene)			5.96E-07	5.96E-07			5.96E-07	5.96E-07	5.96E-07	
Xylenes (isomers and mixtures)				7.10E-07					7.10E-07	
Total			3.10E-05	1.31E-06	3.04E-05	3.04E-05	5.96E-07	3.10E-05	1.31E-06	

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			3.32E-04		3.32E-04	3.32E-04		3.32E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				9.34E-11					9.34E-11	
Toluene (methyl benzene)			6.51E-06	6.51E-06			6.51E-06	6.51E-06	6.51E-06	
Xylenes (isomers and mixtures)				7.75E-06					7.75E-06	
Total			3.38E-04	1.43E-05	3.32E-04	3.32E-04	6.51E-06	3.38E-04	1.43E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				4.87E-05			4.87E-05			4.87E-05			
Chrysene													
Cresol mixtures										2.58E-12			
Ethyl benzene	1.37E-07			1.37E-07	1.37E-07				1.37E-07				
Hexane (n-)										5.51E-06			
Naphthalene												9.99E-06	
Phenol	1.84E-11		1.84E-11						1.84E-11	1.84E-11			
Toluene (methyl benzene)				5.44E-06						5.44E-06		5.44E-06	
Xylenes (isomers and mixtures)										1.65E-06		1.65E-06	
Total	1.37E-07		1.84E-11	5.43E-05	1.37E-07		4.87E-05		1.37E-07	6.13E-05		1.71E-05	

A/N: T2643 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				8.30E-04			8.30E-04			8.30E-04			
Chrysene													
Cresol mixtures										4.40E-11			
Ethyl benzene	2.33E-06			2.33E-06	2.33E-06				2.33E-06				
Hexane (n-)										9.39E-05			
Naphthalene												1.70E-04	
Phenol	3.13E-10		3.13E-10						3.13E-10	3.13E-10			
Toluene (methyl benzene)				9.28E-05						9.28E-05		9.28E-05	
Xylenes (isomers and mixtures)										2.81E-05		2.81E-05	
Total	2.33E-06		3.13E-10	9.25E-04	2.33E-06		8.30E-04		2.33E-06	1.04E-03		2.91E-04	

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	T2640
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	64	feet
Area (For Volume Source Only)	53100	ft^2
Distance-Residential	750	meters
Distance-Commercial	175	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (NO = Tier 1 or Tier 2; YES = Tier 3)	NO	
[redacted]ission Units	lb/hr	
[redacted]rce output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
B1	Benzene (including benzene from gasoline)	9.44E-03	78.11	0.009443282		0.009443282
P15	Chrysene	1.03E-05	228.2928	1.0278E-05		1.0278E-05
C20	Cresol mixtures	3.43E-06	108.14	3.42955E-06		3.42955E-06
E4	Ethyl benzene	1.19E-03	106.16	0.001186084		0.001186084
H8	Hexane (n-)	1.23E-01	86.18	0.122874559		0.122874559
P30	Naphthalene	4.87E-04	128.1732	0.000486601		0.000486601
P3	Phenol	1.15E-06	94.11	1.15315E-06		1.15315E-06
T3	Toluene (methyl benzene)	6.32E-03	92.13	0.006321705		0.006321705
X1	Xylenes (isomers and mixtures)	5.68E-03	106.2	0.005683806		0.005683806
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TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	T2640
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors table:

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.25	13.3
Commercial	2.6475	80.25

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	9.44E-03	9.44E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	1.03E-05	1.03E-05	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	3.43E-06	3.43E-06		1	1	1	1.0000	600	
Ethyl benzene	1.19E-03	1.19E-03	8.70E-03	1	1	1	1	2000	
Hexane (n-)	1.23E-01	1.23E-01		1.0000	1.0000	1	1	7000	
Naphthalene	4.87E-04	4.87E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	1.15E-06	1.15E-06		1	1	1	1	200	5800
Toluene (methyl benzene)	6.32E-03	6.32E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	5.68E-03	5.68E-03		1.0000	1.0000	1	1	700	22000

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	9.44E-03	9.44E-03	82.4965153	0.041248258
Chrysene	1.03E-05	1.03E-05	0.08978893	4.48945E-05
Cresol mixtures	3.43E-06	3.43E-06	0.02996053	1.49803E-05
Ethyl benzene	1.19E-03	1.19E-03	10.3616316	0.005180816
Hexane (n-)	1.23E-01	1.23E-01	1073.43215	0.536716074
Naphthalene	4.87E-04	4.87E-04	4.25094833	0.002125474
Phenol	1.15E-06	1.15E-06	0.01007388	5.03694E-06
Toluene (methyl benzene)	6.32E-03	6.32E-03	55.2264119	0.027613206
Xylenes (isomers and mixtures)	5.68E-03	5.68E-03	49.653725	0.024826863
Total	1.46E-01	1.46E-01	1.28E+03	6.38E-01

A/N: T2640 **Application deemed complete date:** 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	2.96E-07	6.12E-07
Chrysene	3.74E-09	3.80E-09
Cresol mixtures		
Ethyl benzene	3.23E-09	6.69E-09
Hexane (n-)		
Naphthalene	1.83E-08	3.79E-08
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**3.21E-07**	**6.60E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		6.86E-06	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		6.60E-08	Pass	Pass
Developmental - DEV	5.97E-04	2.05E-03	Pass	Pass
Endocrine system - END		6.79E-06	Pass	Pass
Eye	3.45E-05		Pass	Pass
Hematopoietic system - HEM	5.83E-04	1.80E-03	Pass	Pass
Immune system - IMM	5.83E-04		Pass	Pass
Kidney - KID		6.86E-06	Pass	Pass
Nervous system - NS	1.37E-05	2.34E-03	Pass	Pass
Reproductive system - REP	5.97E-04		Pass	Pass
Respiratory system - RES	3.45E-05	9.53E-04	Pass	Pass
Skin			Pass	Pass

A/N: T2640 **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			9.66E-05		9.66E-05	9.66E-05		9.66E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				2.64E-09					2.64E-09	
Toluene (methyl benzene)			2.27E-06	2.27E-06			2.27E-06	2.27E-06	2.27E-06	
Xylenes (isomers and mixtures)				3.44E-06					3.44E-06	
Total			9.89E-05	5.71E-06	9.66E-05	9.66E-05	2.27E-06	9.89E-05	5.71E-06	

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			5.83E-04		5.83E-04	5.83E-04		5.83E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				1.60E-08					1.60E-08	
Toluene (methyl benzene)			1.37E-05	1.37E-05			1.37E-05	1.37E-05	1.37E-05	
Xylenes (isomers and mixtures)				2.07E-05					2.07E-05	
Total			5.97E-04	3.45E-05	5.83E-04	5.83E-04	1.37E-05	5.97E-04	3.45E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.70E-04			1.70E-04			1.70E-04			
Chrysene													
Cresol mixtures										6.18E-09			
Ethyl benzene	6.41E-07			6.41E-07	6.41E-07				6.41E-07				
Hexane (n-)										1.90E-05			
Naphthalene												5.85E-05	
Phenol	6.23E-09		6.23E-09						6.23E-09	6.23E-09			
Toluene (methyl benzene)				2.28E-05						2.28E-05		2.28E-05	
Xylenes (isomers and mixtures)										8.78E-06		8.78E-06	
Total	6.47E-07		6.23E-09	1.94E-04	6.41E-07		1.70E-04		6.47E-07	2.21E-04		9.00E-05	

A/N: T2640 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.80E-03			1.80E-03			1.80E-03			
Chrysene													
Cresol mixtures										6.54E-08			
Ethyl benzene	6.79E-06			6.79E-06	6.79E-06				6.79E-06				
Hexane (n-)										2.01E-04			
Naphthalene												6.19E-04	
Phenol	6.60E-08		6.60E-08						6.60E-08	6.60E-08			
Toluene (methyl benzene)				2.41E-04						2.41E-04		2.41E-04	
Xylenes (isomers and mixtures)										9.30E-05		9.30E-05	
Total	6.86E-06		6.60E-08	2.05E-03	6.79E-06		1.80E-03		6.86E-06	2.34E-03		9.53E-04	

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Thursday, May 23, 2013 1:01 PM
To: Janice West
Subject: FW: Bellows Seal Valves

Below is the rationale for the non-bellow seal valves from the design engineering team. If there is a discrepancy in the count, the paragraph below states that (3) bellow sealed 24" valves were replaced with (2) 30" gate valves on proposed Tank 2640.

John – please see the requested information below. Sorry for the delay – I was out all day yesterday with a doctor's appointment.

Please note, the prior email mentioned 56 exempt valves, but the total now is really 58. In the prior email below the "last fugitive count" I referred to did not include (2) 30" exempt valves (EX4) based on a final decision that had been made recently to go from (3) 24" gate valves on the inlet to the new tank (which would have been bellows seal valves), to the (2) 30" gate valves which then become EX4 exempt. This change was made based on an independent decision related to minimum heel, and nothing to do with exemption status.

Service	Exemption	No. of Valves
HC Gas/Vapor	EX1 – Safety	2
Lt Liquid	EX1 – Safety	36
Lt Liquid	EX3 – Torsional	15
Lt Liquid	EX4 – Not Available	**2 (30")**
Lt Liquid	Control Valves	3
		58

John W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Tuesday, May 21, 2013 9:16 AM
To: Janice West
Subject: RE: crude analyses
Attachments: TANK Speciation.pdf

Attached is a comparison of the results of the Canadian Crude Speciation vs. the speciation used in the submitted calculations. Only n-hexane was detected at a slightly higher concentration. There will be no significant impact on the HRA results, but we will be submitting revised calculations based on the higher n-hexane concentration no later than tomorrow.

The results seam to confirm our position that the speciation that was used is reasonably conservative.

John W. Matthews, P.E.
Environmental Engineer
[redacted]hillips 66 Los Angeles Refinery
[redacted]310) 952-6213
john.matthews@p66.com

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Thursday, May 16, 2013 10:44 AM
To: Matthews, John W
Subject: [EXTERNAL]crude analyses

Hi John,

I told Paul about your plans, and he mentioned that if you currently have other types of crude on hand, a more recent analysis of a non-Canadian crude (in addition to your planned analysis) would provide a better comparison of the relative HAP concentration of your crude slate. Either refuting or confirming the claim that Canadian crudes have more HAPs. Since you're doing analyses anyway…

[redacted]Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Phillps 66
Crude Oil Speciation
(Wt %)

Chemical	CAS	Wt % Used	Canadian Wt %
Cresol (mixed isomers)	1319-77-3	0.001	ND
Naphthalene	91-20-3	0.091	ND
Phenol	108-95-2	0.000	ND
1,2,4-Trimethylbenzene	95-63-6	0.281	0.047
Benzene	71-43-2	0.141	0.120
Cumene	98-82-8	0.002	ND
Cyclohexane	110-82-7	0.740	0.260
Ethylbenzene	100-41-4	0.149	0.041
n-Hexane	110-54-3	0.893	**0.960**
Toluene	108-88-3	0.577	0.230
Xylene (mixed isomers)	1330-20-7	0.944	0.207
Polycyclic Aromatic Compounds (Speciated)			
Benzo(a)phenanthrene	218-01-9	0.002	ND
PACs	N590	0.002	ND
Polynuclear Aromatic Hydrocarbons (Speciated)			
Chrysene	218-01-9	0.002	ND
Naphthalene	91-20-3	0.091	ND
PAHs (excl Naphthalene)	1151	0.002	ND

Janice West

From: Janice West
Sent: Wednesday, May 15, 2013 3:45 PM
To: 'Matthews, John W'
Subject: RE: Crude Oil Toxic Contaminant Speciation

Hi John,

I've reviewed the speciation information with Paul and had our lab verify the analysis methods. Paul (who attended the recent P66 Wilmington toxics meeting) recalled some public comments about the use of Canadian crudes, and it was suggested that they may have higher concentrations of toxics.

Do these three crude analyses represent the types of crudes that are anticipated to be stored in the new tank? Have you sampled any Canadian crudes/do you anticipate using Canadian crudes?

Which analysis was from 1996? How often are analyses of crude done? How long does this sampling and analysis take?

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

From: Matthews, John W [mailto:John.Matthews@p66.com]
Sent: Wednesday, May 15, 2013 3:11 PM
To: Janice West
Subject: Crude Oil Toxic Contaminant Speciation

The speciation used for the crude oil to be stored in the proposed tank 2640 was based on the highest concentrations of constituents reported for existing crude tanks on official reports (AER, TRI, AB2588, etc.). Two of the analyses are based on samples collected in 2004, and one sample was obtained in 1996.

Volatile Organic Compounds were analyzed by EPA Method 8260; Semivolatile Organic Compounds were analyzed by EPA Method 8270; and Metals by EPA Method 6010.

The test methods are specified in the attached spreadsheet.

Since this speciation is used on the official reports, it is considered the most accurate and reliable information currently available.

I will be sending the engineering justification for the non-bellows seal valves soon, in a separate e-mail.

John W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

Janice West

From: Joan Niertit
Sent: Wednesday, May 15, 2013 3:39 PM
To: Janice West
Cc: Rudy Eden
Subject: RE: Crude Oil Toxic Contaminant Speciation

Methods are OK, but, as you said, the analyses were done a long time ago! Toxic compounds change from oilfield to oilfield. The email says that these were the highest concentrations ever found, so I wonder how long they've be doing sampling and analysis for this. If they've been routinely analyzing samples for 15+ years and really did pick the highest ever, then... yes, they've probably captured a good picture of worst case. IF they've only taken one or two samples, then there's no saying what the crude oil has looked like over the past 15 years... and what it might look like in the future.

From: Janice West
Sent: Wednesday, May 15, 2013 3:29 PM
To: Joan Niertit
Subject: FW: Crude Oil Toxic Contaminant Speciation

From: Matthews, John W [mailto:John.Matthews@p66.com]
Sent: Wednesday, May 15, 2013 3:11 PM
To: Janice West
Subject: Crude Oil Toxic Contaminant Speciation

The speciation used for the crude oil to be stored in the proposed tank 2640 was based on the highest concentrations of constituents reported for existing crude tanks on official reports (AER, TRI, AB2588, etc.). Two of the analyses are based on samples collected in 2004, and one sample was obtained in 1996.

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Since this speciation is used on the official reports, it is considered the most accurate and reliable information currently available.

I will be sending the engineering justification for the non-bellows seal valves soon, in a separate e-mail.

John W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Wednesday, May 15, 2013 3:11 PM
To: Janice West
Subject: Crude Oil Toxic Contaminant Speciation
Attachments: Test Methods.xlsx

The speciation used for the crude oil to be stored in the proposed tank 2640 was based on the highest concentrations of constituents reported for existing crude tanks on official reports (AER, TRI, AB2588, etc.). Two of the analyses are based on samples collected in 2004, and one sample was obtained in 1996.

Volatile Organic Compounds were analyzed by EPA Method 8260; Semivolatile Organic Compounds were analyzed by EPA Method 8270; and Metals by EPA Method 6010.

The test methods are specified in the attached spreadsheet.

Since this speciation is used on the official reports, it is considered the most accurate and reliable information currently available.

I will be sending the engineering justification for the non-bellows seal valves soon, in a separate e-mail.

John W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

Phillps 66
Crude Oil Speciation

Chemical	CAS	Test Method
Nickel Compounds	N495	EPA 6010B
Zinc Compounds	N982	EPA 6010B
Cresol (mixed isomers)	1319-77-3	EPA 8270C
Naphthalene	91-20-3	EPA 8270C
Phenol	108-95-2	EPA 8270C
1,2,4-Trimethylbenzene	95-63-6	EPA 8260B
Benzene	71-43-2	EPA 8260B
Cumene	98-82-8	EPA 8260B
Cyclohexane	110-82-7	EPA 8260B (Super)
Ethylbenzene	100-41-4	EPA 8260B
n-Hexane	110-54-3	EPA 8260B (Super)
Toluene	108-88-3	EPA 8260B
Xylene (mixed isomers)	1330-20-7	EPA 8260B
Polycyclic Aromatic Compounds (Speciated)		
Benzo(a)phenanthrene	218-01-9	EPA 8270C
PACs	N590	EPA 8270C
Polynuclear Aromatic Hydrocarbons (Speciated)		
Chrysene	218-01-9	EPA 8270C
Naphthalene	91-20-3	EPA 8270C
PAHs (excl Naphthalene)	1151	EPA 8270C

Janice West

From: Janice West
Sent: Tuesday, May 14, 2013 2:59 PM
To: 'Matthews, John W'
Subject: draft crude tanks permits for your review
Attachments: draft permit _crude tanks.doc

Hi John,

Attached are the draft permits for the crude tanks project. The evaluation is still under review, so it is not final. Please let me know your comments or questions.

Btw, Based on the crude speciation, I categorized the new crude tank as a Subpart CC Group 1 tank. Let me know if this is consistent with your Subpart CC assessment. (the criteria is 2% HAPs for new construction).

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Equipment	ID No.	Conn To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
Process 10 : STORAGE TANKS					P13.2
System 7 : DOMED EXTERNAL FLOATING ROOF TANKS					
STORAGE TANK, DOMED EXTERNAL FLOATING ROOF, NO. 2640, CRUDE OIL, WELDED SHELL, 575000 BBL; DIAMETER: 260 FT; HEIGHT: 64 FT WITH A/N: 544857 DOME COVER, GEODESIC FLOATING ROOF, PONTOON PRIMARY SEAL, CATEGORY A METALLIC SHOE SECONDARY SEAL, CATEGORY A, RIM MOUNTED GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED	Dccc			**HAP: (10) [40CFR 63 Subpart CC, #3A, 6-23-2003]**	C1.xb, E193.x, H23.17
STORAGE TANK, DOMED EXTERNAL FLOATING ROOF, NO. 2643, CRUDE/WATER, WELDED SHELL, 11500 BBL; DIAMETER: 40 FT; HEIGHT: 48 FT WITH A/N: 544859 DOME COVER, GEODESIC FLOATING ROOF, DOUBLE DECK PRIMARY SEAL, CATEGORY A METALLIC SHOE SECONDARY SEAL, CATEGORY A, RIM MOUNTED GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED	Dddd			**HAP: (10) [40CFR 63 Subpart CC, #2, 6-23-2003]**	C1.xc, E193.x, H23.17
STORAGE TANK, DOMED EXTERNAL FLOATING ROOF, NO. R-510, CRUDE OIL, WELDED, WITH TWO MIXERS, 320000 BBL; DIAMETER: 218 FT; HEIGHT: 50 FT WITH A/N: ~~535286~~ 544860 DOME COVER, GEODESIC FLOATING ROOF, PONTOON~~, WELDED SHELL~~ PRIMARY SEAL, CATEGORY A, MECHANICAL ~~METALLIC~~ SHOE SECONDARY SEAL, CATEGORY A, SHOE MOUNTED ~~B OR BETTER, WIPER TYPE~~ GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED	D394			**HAP: (10) [40CFR 63 Subpart CC, #2, 6-23-2003]**	C1.xa, ~~C1.17~~, E193.x, H23.4
STORAGE TANK, DOMED EXTERNAL FLOATING ROOF, NO. R-511, CRUDE OIL, WELDED, WITH TWO MIXERS, 320000 BBL; DIAMETER: 218 FT; HEIGHT: 50 FT WITH	D395			**HAP: (10) [40CFR 63 Subpart CC, #2, 6-23-2003]**	C1.xa, ~~C1.17~~, E193.x, H23.4

Equipment	ID No.	Conn To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
A/N: ~~535287~~ 544861 DOME COVER, GEODESIC FLOATING ROOF, PONTOON PRIMARY SEAL, CATEGORY A, MECHANICAL ~~METALLIC~~ SHOE SECONDARY SEAL, CATEGORY A, SHOE MOUNTED ~~B OR BETTER, WIPER TYPE~~ GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED					

CONDITIONS

PROCESS CONDITIONS

P13.2 All devices under this process are subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
Benzene	40CFR61, SUBPART	FF

[40CFR 61 Subpart FF, 12-4-2003]

[Processes subject to this condition : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]

SYSTEM CONDITIONS

DEVICE CONDITIONS

~~C1.17 The operator shall limit the throughput to no more than 4.5625e+06 barrel(s) in any one year.~~

~~[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]~~

~~[Devices subject to this condition : D394, D395]~~

C1.xa The operator shall limit the throughput to no more than 1.52 e+06 barrel(s) in any one calendar month.

The operator shall comply with the following throughput measurement practices.

The operator shall calculate the throughput, in barrels, by the following equation: 0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The ATLG installed shall be verified once per quarter by comparing against a manual tank level measurement. If the ATLG differs from the manual tank level measurement by more than 1.0 inch or 0.8%, whichever is greater, the ATLG shall be repaired and put back into service within 10 days. While the ATLG is being repaired, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to the discovery of the discrepancy.

In the event of a failure or routine maintenance of the ATLG, the ATLG shall be repaired (if necessary) and put back into service within 10 days of the time that the ATLG failed or was removed from service for maintenance. While the ATLG is being repaired or maintained, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to time that the ATLG went out of service.

The operator shall keep adequate records to show compliance with the limitations specified in this permit. Such records shall be maintained and kept on file for at least two years and shall be made available to the executive officer or his authorized representative upon request.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D394, D395]

C1.xb The operator shall limit the throughput to no more than 2.5 e+06 barrel(s) in any one calendar month.

The operator shall comply with the following throughput measurement practices.

The operator shall calculate the throughput, in barrels, by the following equation: 0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The ATLG installed shall be verified once per quarter by comparing against a manual tank level measurement. If the ATLG differs from the manual tank level measurement by more than 1.0 inch or 0.8%, whichever is greater, the ATLG shall be repaired and put back into service within 10 days. While the ATLG is being repaired, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to the discovery of the discrepancy.

In the event of a failure or routine maintenance of the ATLG, the ATLG shall be repaired (if necessary) and put back into service within 10 days of the time that the ATLG failed or was

removed from service for maintenance. While the ATLG is being repaired or maintained, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to time that the ATLG went out of service.

The operator shall keep adequate records to show compliance with the limitations specified in this permit. Such records shall be maintained and kept on file for at least two years and shall be made available to the executive officer or his authorized representative upon request.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : Dccc]

C1.xc The operator shall limit the throughput to no more than 64,000 barrel(s) in any one calendar month.

The operator shall comply with the following throughput measurement practices.

The operator shall calculate the throughput, in barrels, by the following equation: 0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The ATLG installed shall be verified once per quarter by comparing against a manual tank level measurement. If the ATLG differs from the manual tank level measurement by more than 1.0 inch or 0.8%, whichever is greater, the ATLG shall be repaired and put back into service within 10 days. While the ATLG is being repaired, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to the discovery of the discrepancy.

In the event of a failure or routine maintenance of the ATLG, the ATLG shall be repaired (if necessary) and put back into service within 10 days of the time that the ATLG failed or was removed from service for maintenance. While the ATLG is being repaired or maintained, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to time that the ATLG went out of service.

The operator shall keep adequate records to show compliance with the limitations specified in this permit. Such records shall be maintained and kept on file for at least two years and shall be made available to the executive officer or his authorized representative upon request.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : Dddd]

E193.x The operator shall install this equipment according to the following specifications:

The operator shall not use this equipment with materials having a Reid vapor pressure of 11

psia or greater.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : Dccc, Dddd, D394, D395]

H23.4 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1149
VOC	40CFR60, SUBPART	K

[RULE 1149, 7-14-1995; RULE 1149, 5-2-2008; **40CFR 60 Subpart K, 10-17-2000]**

[Devices subject to this condition : D394, D395, D396, D397]

H23.17 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1149
VOC	40CFR60, SUBPART	Kb

[RULE 1149, 7-14-1995; RULE 1149, 5-2-2008; **40CFR 60 Subpart Kb, 10-15-2003]**

[Devices subject to this condition : Dccc, Dddd]

Janice West

From: Michael Choi [mchoi@envaudit.com]
Sent: Monday, May 13, 2013 10:24 AM
To: Janice West
Cc: John.Matthews@p66.com
Subject: Phillips 66 - Tank 2643 Crude Float

Janice,

I confirmed that the crude float in Tank 2643 is not more than a few inches at the top of the tank. The goal is to move the skim oil to recovery where it can be processed. However, it is not an automated process, so the actual height is Operations dependent.

Regards,

Michael Choi
Air Quality Specialist | Environmental Audit, Inc.
714.632.8521 x 227 | mchoi@envaudit.com

The information in this email, and any attachments, may contain confidential information and is intended solely for the attention and use of the named addressee(s). It must not be disclosed to any person(s) without authorization. If you are not the intended recipient, or a person responsible for delivering it to the intended recipient, you are not authorized to, and must not, disclose, copy, distribute, or retain this message or any part of it. If you have received this communication in error, please notify the sender immediately.

Janice West

From: Michael Choi [mchoi@envaudit.com]
Sent: Thursday, May 09, 2013 9:45 AM
To: Janice West
Cc: 'Matthews, John W'
Subject: RE: crude tank questions

Janice,

Tanks 510/511 have shoe mounted secondary seals. Did you want us to update the 400-E-18 forms?

Regards,

Michael Choi
Air Quality Specialist | Environmental Audit, Inc.
714.632.8521 x 227 | mchoi@envaudit.com

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From: Janice West [mailto:jwest@aqmd.gov]
Sent: Wednesday, May 08, 2013 6:09 PM
To: Michael Choi
Cc: Matthews, John W
Subject: RE: crude tank questions

Hi Michael,

I'm reviewing the Phillips 66 crude tank emission calculations, and noted that for Tanks 510/511, you used "shoe-mounted" for the secondary seal TANKS emissions report, but the 400-E-18 form specifies "rim mounted". Can you verify that tanks 510/511 have rim-mounted secondary seals?

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

From: Michael Choi [mailto:mchoi@envaudit.com]
Sent: Monday, April 29, 2013 11:46 AM
To: Janice West
Cc: 'Matthews, John W'
Subject: RE: crude tank questions

Janice,

Here is the updated TANKS run for Tank 2640. I have also included a complete 400-E-GI form. The emissions did not change when the roof type was corrected to pontoon.

Please contact me with any further questions or comments.

Regards,

Michael Choi
Air Quality Specialist | Environmental Audit, Inc.
714.632.8521 x 227 | mchoi@envaudit.com

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From: Matthews, John W [mailto:John.Matthews@p66.com]
Sent: Friday, April 26, 2013 3:26 PM
To: 'Marcia Baverman'
Cc: 'Michael Choi'
Subject: FW: crude tank questions

Copy of transmittal for your file.

From: Matthews, John W
Sent: Friday, April 26, 2013 1:40 PM
To: 'Janice West'
Subject: RE: crude tank questions

1. The cost estimate for doming Tanks 510 and 511 was $2.5MM, and bids are coming in lower than that. The cost estimate to replace Tanks 510 and 511 is $13.5MM. The ratio of the doming cost to the replacement cost is 18.5%. The construction cost is less than 50% of the replacement cost, therefore the doming project is not reconstruction.

2. More detailed design data has justified lighter roofs for the proposed tanks reducing the number of legs required. Revised emission calculations have been prepared consistent with the updated 400-E-18 forms. The revised emission calculations and the updated 400-E-18 forms are attached in 400-e-gi... and Signed E-18..., respectively.

3. The scaling factor used to compensate for the difference in the size of the legs is the ratio of the diameters (4/3). The emissions are estimated by taking the difference between the 3" leg run and the legless run and applying the scaling factor to the difference in emissions and adding that result to the legless emissions.

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Monday, April 22, 2013 2:49 PM
To: Matthews, John W
Subject: [EXTERNAL]crude tank questions

Hi John,

Please let me know whether the tank doming for Tanks 510 and 511 has costs high enough to constitute reconstruction. I'm guessing it doesn't, but would like you to confirm.

When comparing the TANKS calculation you provided with the 400-E-18 for Tank 2640, there seems to be a discrepancy between the fittings listed in the form and those used in your TANKS calculations. Specifically,

Form 400-E-18 shows 6 access hatches and 0 ladder wells, and TANKS shows 4 access hatches and 1 ladder well.

For Tank 510/511, Form 400-E-18 shows:

400-E-18	TANKS	Category
0	1	Roof drains, 90% closed
33	34	Roof leg (3-in diam.)/Adjustable, Pontoon Area, Gasketed
75	77	Roof Leg (3-in diam.)/Adjustable, Center Area, Gasketed

Please let me know which are the correct fittings. The forms seem to have changed since the last time they were submitted.

Also, precisely how did you scale the leg emissions (3" vs 4" legs)?

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
vest@aqmd.gov

No virus found in this message.
Checked by AVG - www.avg.com
Version: 2013.0.3272 / Virus Database: 3162/6308 - Release Date: 05/08/13

Janice West

From: Michael Choi [mchoi@envaudit.com]
Sent: Thursday, May 09, 2013 4:36 PM
To: Gary.Stutheit@jacobs.com
Cc: John.Matthews@p66.com; Janice West
Subject: P66 - Tank 2643 Crude Content

Gary,

Please confirm that the crude content of Tank 2643 is not more than a few inches of float at the top of the tank (<2%).

Cheers,

Michael Choi
Air Quality Specialist | Environmental Audit, Inc.
714.632.8521 x 227 | mchoi@envaudit.com

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Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Monday, April 29, 2013 2:56 PM
To: Janice West
Subject: RE: crude vapor speciation for fugitive emissions

The values for crude vapor wt % (in the Table below) are based on Raoult's Law calculations performed within TANKS for the June meteorological conditions, because June is considered to be the worst case for emissions.

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Monday, April 29, 2013 11:55 AM
To: Matthews, John W
Subject: [EXTERNAL]crude vapor speciation for fugitive emissions

Hi John,

You sent me the crude liquid hybrid wt% of HAPs, but can you tell me the origin of the crude vapor wt% of HAPs that you're using for speciation of fugitive emissions?

Chemical	CAS	Crude Hybrid [1] Wt%	crude vapor wt%
1,2,4-Trimethylbenzene	95-63-6	0.2812269	0.01
Benzene	71-43-2	0.1414124	2.83
Chrysene	218-01-9	0.002	0
Cresol (mixed isomers)	1319-77-3	0.0005707	0
Cumene (isopropyl benzene)	98-82-8	0.002471	0
Cyclohexane	110-82-7	0.74	19.14
Ethylbenzene	100-41-4	0.1492876	0.13
Hexane	110-54-3	0.8933333	38.55
Naphthalene	91-20-3	0.0914786	0
Phenol	108-95-2	0.0002283	0
Toluene	108-88-3	0.5772455	1.01
Xylene (mixed isomers)	1330-20-7	0.9441758	0.19
unidentified		96.17657	38.14
		100	100

I received Michael Choi's updated information for Tank 2640. Pontoon vs double deck is something that's listed in the equipment description, so I wanted to be sure that it's a pontoon roof.

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Janice West

From: Michael Choi [mchoi@envaudit.com]
Sent: Monday, April 29, 2013 11:46 AM
To: Janice West
Cc: 'Matthews, John W'
Subject: RE: crude tank questions
Attachments: 05 - 400-e-gi Supplemental.pdf; Attachment B (rev1).pdf

Janice,

Here is the updated TANKS run for Tank 2640. I have also included a complete 400-E-GI form. The emissions did not change when the roof type was corrected to pontoon.

Please contact me with any further questions or comments.

Regards,

Michael Choi
[redacted]r Quality Specialist | Environmental Audit, Inc.
[redacted]14.632.8521 x 227 | mchoi@envaudit.com

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Sent: Friday, April 26, 2013 3:26 PM
To: 'Marcia Baverman'
Cc: 'Michael Choi'
Subject: FW: crude tank questions

[redacted]opy of transmittal for your file.

From: Matthews, John W
Sent: Friday, April 26, 2013 1:40 PM
To: 'Janice West'
Subject: RE: crude tank questions

1. The cost estimate for doming Tanks 510 and 511 was $2.5MM, and bids are coming in lower than that. The cost estimate to replace Tanks 510 and 511 is $13.5MM. The ratio of the doming cost to the replacement cost is 18.5%. The construction cost is less than 50% of the replacement cost, therefore the doming project is not reconstruction.

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To: Matthews, John W
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Please let me know which are the correct fittings. The forms seem to have changed since the last time they were submitted.

Also, precisely how did you scale the leg emissions (3" vs 4" legs)?

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Friday, April 26, 2013 1:40 PM
To: Janice West
Subject: RE: crude tank questions
Attachments: 05 - 400-e-gi Supplemental.pdf; 06 - Signed E-18 Forms.pdf

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Also, precisely how did you scale the leg emissions (3" vs 4" legs)?

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944
Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): Phillips 66 Los Angeles Refinery, Carson Plant

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 171109

Address where the equipment will be operated (for equipment which will be moved to various locations in AQMD's jurisdiction, please list the initial location site): 1520 East Sepulveda Boulevard, Carson, CA 90745

(•) Fixed Location ( ) Various Locations

Tank Type (Select ONE)

( ) External Floating Roof Tank (EFRT) ( ) Internal Floating Roof Tank (IFRT) ( ) Horizontal Tank (HT)
( ) Vertical Fixed Roof Tank (VFRT) (•) Domed External Roof Tank (DEFRT)

Identification

Tank Identification Number: 2640

Tank Contents/Product (include MSDS): Crude Oil with 11 RVP

Section B - Tank Information

Tank Characteristics

Shell Diameter (ft.): 260
Shell Length (ft.):
Shell Height (ft.): 65
Turnovers Per Year: 60

Is Tank Heated? ( ) Yes (•) No
Is Tank Underground? ( ) Yes (•) No
Net Throughput (gal/year): 1260MM
Self Support Roof: (•) Yes ( ) No

Number of Columns? 0
Effective Column Diameter: ( ) 9" by 7" Built Up Column - 1.1 ( ) 8" Diameter Pipe - 0.7 ( ) Unknown - 1

External Shell Condition: (•) Good ( ) Poor
Internal Shell Color: (•) Light Rust ( ) Dense Rust ( ) Gunite Lining
External Shell Color: (•) White/White ( ) Aluminum/Specular ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Gray/Medium ( ) Red/Primer

Average Liquid Height (ft.) (Vertical Only): 30
Maximum Liquid Height (ft.) (Vertical Only): 60
Working Volume (gal.) (Vertical Only): 21005922
Actual Volume (gal.) (Vertical Only): 25815552

Paint Condition: (•) Good ( ) Poor
Paint Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Roof Characteristics (Floating Roof Tank)

Roof Type: ( ) Pontoon ( ) Double Deck (•) Dome Roof (Height 53 ft.) ( ) Cone Roof (Height ____ ft.)
Roof Fitting Category: ( ) Typical (•) Detail
Roof Height (ft.):

Roof Paint Condition: (•) Good ( ) Poor
Roof Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Deck Characteristics (Floating Roof Tank)

Deck Type: (•) Welded ( ) Bolted
Deck Fitting Characteristics: ( ) Typical ( ) Detailed (Complete Deck Seam)
Construction: ( ) Sheet ( ) Panel
Deck Seam Length (ft.):
Deck Seam: ( ) 5 ft. wide ( ) 6 ft. wide ( ) 7 ft. wide ( ) 5 x 7.5 ft. ( ) 5 x 12 ft.

Tank Construction and Rim -Seal System (Floating Roof Tank)

Tank Construction: (•) Welded ( ) Riveted
Primary Seal: (•) Mechanical Shoe ( ) Liquid Mounted ( ) Vapor Mounted
Secondary Seal: (•) Rim Mounted ( ) None ( ) Shoe Mounted

Breather Vent Setting

Vacuum Setting (psig):
Pressure Setting (psig):

* Section D of the application MUST be completed.

© South Coast Air Quality Management District, Form 400-E-18 (2009.04)

South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944
Tel: (909) 396-3385
www.aqmd.gov

Section B - Tank Information (cont.)

Site Selection

Nearest Major City: Long Beach

Daily Average Ambient Temperature (°F): 64.31 Annual Average Minimum Temperature (°F): 54.40

Annual Average Maximum Temperature (°F): 74.22 Average Wind Speed (mph): 6.36

Annual Average Solar Insulation Factor (Btu / (ft^3 * ft * day)): 1571.65

Tank Contents

Chemical Category: ○ Organic Liquids ◉ Crude Oil ○ Petroleum Distillates

Liquid: ○ Single ◉ Multiple

If Multiple, Select Speciation Option: ○ Full Speciation ◉ Partial Speciation ○ Various Weight Speciation ○ None

Section C - Operation Information

Vapor Control

Vapor Control During Loading or Unloading: ☐ Sparger ☐ Vapor Balance System ☐ Vapor Return Line ☐ Vented to Air Pollution Control Equipment [1]

[1] A separate permit is required. If APC equipment is already permitted, provide Permit or Device Number: _____

Vent Valve Data

Indicate Type of Setting and Vapor Disposal

	Number	Pressure Setting	Vaccum Setting	Discharging to (Check Appropriate Box) Atmosphere	Vapor Control	Flare
Combination				☐	☐	☐
Pressure				☐	☐	☐
Vaccum				☐	☐	☐
Open				☐	☐	☐

Materials

Name all liquids, vapors, gases, or mixtures of such material to be stored in this tank:
Crude Oil

If material is stored in a solution, supply the following information:

Name of Solvent: _____ Name of Materials Dissolved: _____

Concentration of Materials Dissolved: _____ % by Weight OR _____ % by Volume OR _____ lbs/gal

Section D - Roof/Deck Fitting

Section D is required for the following tanks: External Floating Roof Tank, Internal Floating Roof Tanks, or Domed External Floating Roof Tanks.

Select the number of fittings for each applicable question. Examples: 3 Unbolted Cover, Ungasketed
_____ Unbolted Cover, Gasketed

Roof/Deck Fitting Details

1. Access Hatch (24" diameter well)	2. Automatic Gauge Float Well (20" diameter well)	3. Column Well (24" diameter well)
4 Bolted Cover, Gasketed	1 Bolted Cover, Gasketed	_____ Built-Up Col - Sliding Cover, Gasketed
_____ Unbolted Cover, UnGasketed	_____ Unbolted Cover, Ungasketed	_____ Built-Up Col - Sliding Cover, Ungasketed
_____ Unbolted Cover, Gasketed	_____ Unbolted Cover, Gasketed	_____ Pipe Col - Flex, Fabric Sleeve Seal
		_____ Pipe Col - Sliding Cover, Gasketed
		_____ Pipe Col - Sliding Cover, Ungasketed

© South Coast Air Quality Management District, Form 400-E-18 (2009.04)

South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Section D - Roof/Deck Fitting (cont.)

Roof/Deck Fitting Details (cont.)

4. Gauge Hatch/Sample Well (8" diameter well)
   - 1 Weighted Mechanical Actuation, Gasketed
   - ____ Weighted Mechanical Actuation, Ungasketed

5. Ladder Well (36" diameter)
   - ____ Sliding Cover, Gasketed
   - ____ Sliding Cover, Ungasketed

6. Rim Vent (6" diameter)
   - ____ Weighted Mechanical Actuation, Gasketed
   - ____ Weighted Mechanical Actuation, Ungasketed

7. Roof Drain (3" diameter)
   - ____ Open
   - 3 90% Close

8. Roof Leg (3" diameter leg)
   - ____ Adjustable, Pontoon Area, Ungasketed
   - ____ Adjustable, Center Area, Ungasketed
   - ____ Adjustable, Double-Deck Roofs
   - ____ Fixed
   - 34 Adjustable, Pontoon Area, Gasketed
   - ____ Adjustable, Pontoon Area, Sock
   - 134 Adjustable, Center Area, Gasketed
   - ____ Adjustable, Center Area, Sock

9. Roof Leg or Hang Well
   - ____ Adjustable
   - ____ Fixed

10. Sample Pipe (24" diameter)
    - ____ Slotted Pipe – Sliding Cover, Gasketed
    - ____ Slotted Pipe – Sliding Cover, Ungasketed
    - ____ Slit Fabric Seal, 10% Open

11. Guided Pole/Sample Well
    - ____ Ungasketed, Sliding Cover, Without Float
    - ____ Ungasketed Sliding Cover, With Float
    - ____ Gasketed Sliding Cover, Without Float
    - ____ Gasketed Sliding Cover, With Float
    - ____ Gasketed Sliding Cover, With Pole Sleeve
    - ____ Gasketed Sliding Cover, With Pole Wiper
    - ____ Gasketed Sliding Cover, With Float, Wiper
    - ____ Gasketed Sliding Cover, With Float, Sleeve, Wiper
    - ____ Gasketed Sliding Cover, With Pole Sleeve, Wiper

12. ____ Stub Drain (1" diameter)

13. Unslotted Guide - Pole Well
    - ____ Ungasketed, Sliding Cover
    - ____ Gasketed Sliding Cover
    - ____ Ungasketed Sliding Cover with Sleeve
    - ____ Gasketed Sliding Cover with Sleeve
    - 3 Gasketed Sliding Cover with Wiper

14. Vacuum Breaker (10" diameter well)
    - 5 Weighted Mechanical Actuation, Gasketed
    - ____ Weighted Mechanical Actuation, Ungasketed

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: Marcia Baverman Date: 4/26/13

Title: Project Manager Company Name: Environmental Audit Inc.

Name: Marcia Baverman

Phone #: (714) 632-8521 Fax #: (714) 632-6754

Email: mbaverman@envaudit.com

Contact Info

Name: John Matthews

Title: Env. Engineer Company Name: Philips 66

Phone #: (310) 952-6213 Fax #:

Email: John.Matthews@p66.com

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South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944
Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): Phillips 66 Los Angeles Refinery, Carson Plant

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 171109

Address where the equipment will be operated (for equipment which will be moved to various locations in AQMD's jurisdiction, please list the initial location site): 1520 East Sepulveda Boulevard, Carson, CA 90745

(•) Fixed Location ( ) Various Locations

Tank Type (Select ONE)

( ) External Floating Roof Tank (EFRT) ( ) Internal Floating Roof Tank (IFRT) ( ) Horizontal Tank (HT)
( ) Vertical Fixed Roof Tank (VFRT) (•) Domed External Roof Tank (DEFRT)

Identification

Tank Identification Number: 2643

Tank Contents/Product (include MSDS): Salt water draw from crude oil (RVP 11) storage tanks

Section B - Tank Information

Tank Characteristics

Shell Diameter (ft.): 44
Shell Length (ft.):
Shell Height (ft.): 52
Turnovers Per Year: 77

Is Tank Heated? ( ) Yes (•) No
Is Tank Underground? ( ) Yes (•) No
Net Throughput (gal/year): 32.256MM
Self Support Roof: (•) Yes ( ) No

Number of Columns? 0
Effective Column Diameter: ( ) 9" by 7" Built Up Column - 1.1 ( ) 8" Diameter Pipe - 0.7 ( ) Unknown - 1

External Shell Condition: (•) Good ( ) Poor
Internal Shell Color: (•) Light Rust ( ) Dense Rust ( ) Gunite Lining
External Shell Color: (•) White/White ( ) Aluminum/Specular ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Gray/Medium ( ) Red/Primer

Average Liquid Height (ft.) (Vertical Only): 30
Maximum Liquid Height (ft.) (Vertical Only): 45
Working Volume (gal.) (Vertical Only): 421470
Actual Volume (gal.) (Vertical Only): 586782

Paint Condition: (•) Good ( ) Poor
Paint Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Roof Characteristics (Floating Roof Tank)

Roof Type: ( ) Pontoon ( ) Double Deck (•) Dome Roof (Height 7 ft.) ( ) Cone Roof (Height ____ ft.)
Roof Fitting Category: ( ) Typical (•) Detail
Roof Height (ft.):

Roof Paint Condition: (•) Good ( ) Poor
Roof Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Deck Characteristics (Floating Roof Tank)

Deck Type: (•) Welded ( ) Bolted
Deck Fitting Characteristics: ( ) Typical ( ) Detailed (Complete Deck Seam)

Construction:	Deck Seam Length (ft.):	Deck Seam:
( ) Sheet		( ) 5 ft. wide ( ) 6 ft. wide ( ) 7 ft. wide
( ) Panel		( ) 5 x 7.5 ft. ( ) 5 x 12 ft.

Tank Construction and Rim -Seal System (Floating Roof Tank)

Tank Construction: (•) Welded ( ) Riveted
Primary Seal: (•) Mechanical Shoe ( ) Liquid Mounted ( ) Vapor Mounted
Secondary Seal: (•) Rim Mounted ( ) None ( ) Shoe Mounted

Breather Vent Setting

Vacuum Setting (psig):
Pressure Setting (psig):

* Section D of the application MUST be completed.

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South Coast Air Quality Management District

Form 400-E-18
Storage Tank

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Tel: (909) 396-3385
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Section B - Tank Information (cont.)

Site Selection

Nearest Major City: Long Beach

Daily Average Ambient Temperature (°F): 64.31 Annual Average Minimum Temperature (°F): 54.40

Annual Average Maximum Temperature (°F): 74.22 Average Wind Speed (mph): 6.36

Annual Average Solar Insulation Factor (Btu / (ft^3 * ft * day)): 1571.65

Tank Contents

Chemical Category: ○ Organic Liquids ◉ Crude Oil ○ Petroleum Distillates

Liquid: ○ Single ◉ Multiple

If Multiple, Select Speciation Option: ○ Full Speciation ◉ Partial Speciation ○ Various Weight Speciation ○ None

Section C - Operation Information

Vapor Control

Vapor Control During Loading or Unloading: ☐ Sparger ☐ Vapor Balance System ☐ Vapor Return Line ☐ Vented to Air Pollution Control Equipment [1]

[1] A separate permit is required. If APC equipment is already permitted, provide Permit or Device Number: _____

Vent Valve Data

Indicate Type of Setting and Vapor Disposal

	Number	Pressure Setting	Vaccum Setting	Discharging to (Check Appropriate Box) Atmosphere	Vapor Control	Flare
Combination				☐	☐	☐
Pressure				☐	☐	☐
Vaccum				☐	☐	☐
Open				☐	☐	☐

Materials

Name all liquids, vapors, gases, or mixtures of such material to be stored in this tank:
Salt water with crude oil

If material is stored in a solution, supply the following information:

Name of Solvent: _____ Name of Materials Dissolved: _____

Concentration of Materials Dissolved: _____ % by Weight OR _____ % by Volume OR _____ lbs/gal

Section D - Roof/Deck Fitting

Section D is required for the following tanks: External Floating Roof Tank, Internal Floating Roof Tanks, or Domed External Floating Roof Tanks.

Select the number of fittings for each applicable question. Examples: 3 Unbolted Cover, Ungasketed
_____ Unbolted Cover, Gasketed

Roof/Deck Fitting Details

1. Access Hatch (24" diameter well)	2. Automatic Gauge Float Well (20" diameter well)	3. Column Well (24" diameter well)
2 Bolted Cover, Gasketed	1 Bolted Cover, Gasketed	_____ Built-Up Col - Sliding Cover, Gasketed
_____ Unbolted Cover, UnGasketed	_____ Unbolted Cover, Ungasketed	_____ Built-Up Col - Sliding Cover, Ungasketed
_____ Unbolted Cover, Gasketed	_____ Unbolted Cover, Gasketed	_____ Pipe Col - Flex, Fabric Sleeve Seal
		_____ Pipe Col - Sliding Cover, Gasketed
		_____ Pipe Col - Sliding Cover, Ungasketed

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Section D - Roof/Deck Fitting (cont.)

Roof/Deck Fitting Details (cont.)

4. Gauge Hatch/Sample Well (8" diameter well)
   - 1 Weighted Mechanical Actuation, Gasketed
   - ____ Weighted Mechanical Actuation, Ungasketed

5. Ladder Well (36" diameter)
   - 1 Sliding Cover, Gasketed
   - ____ Sliding Cover, Ungasketed

6. Rim Vent (6" diameter)
   - ____ Weighted Mechanical Actuation, Gasketed
   - ____ Weighted Mechanical Actuation, Ungasketed

7. Roof Drain (3" diameter)
   - ____ Open
   - 1 90% Close

8. Roof Leg (3" diameter leg)
   - ____ Adjustable, Pontoon Area, Ungasketed
   - ____ Adjustable, Center Area, Ungasketed
   - 12 Adjustable, Double-Deck Roofs
   - ____ Fixed
   - ____ Adjustable, Pontoon Area, Gasketed
   - ____ Adjustable, Pontoon Area, Sock
   - ____ Adjustable, Center Area, Gasketed
   - ____ Adjustable, Center Area, Sock

9. Roof Leg or Hang Well
   - ____ Adjustable
   - ____ Fixed

10. Sample Pipe (24" diameter)
    - ____ Slotted Pipe – Sliding Cover, Gasketed
    - ____ Slotted Pipe – Sliding Cover, Ungasketed
    - ____ Slit Fabric Seal, 10% Open

11. Guided Pole/Sample Well
    - ____ Ungasketed, Sliding Cover, Without Float
    - ____ Ungasketed Sliding Cover, With Float
    - ____ Gasketed Sliding Cover, Without Float
    - ____ Gasketed Sliding Cover, With Float
    - ____ Gasketed Sliding Cover, With Pole Sleeve
    - ____ Gasketed Sliding Cover, With Pole Wiper
    - ____ Gasketed Sliding Cover, With Float, Wiper
    - ____ Gasketed Sliding Cover, With Float, Sleeve, Wiper
    - ____ Gasketed Sliding Cover, With Pole Sleeve, Wiper

12. ____ Stub Drain (1" diameter)

13. Unslotted Guide - Pole Well
    - ____ Ungasketed, Sliding Cover
    - ____ Gasketed Sliding Cover
    - ____ Ungasketed Sliding Cover with Sleeve
    - ____ Gasketed Sliding Cover with Sleeve
    - 3 Gasketed Sliding Cover with Wiper

14. Vacuum Breaker (10" diameter well)
    - 1 Weighted Mechanical Actuation, Gasketed
    - ____ Weighted Mechanical Actuation, Ungasketed

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: Marcia Baver Date: 4/26/13

Name: Marcia Baverman

Title: Project Manager

Company Name: Environmental Audit Inc.

Phone #: (714) 632-8521 Fax #: (714) 632-6754

Email: mbaverman@envaudit.com

Contact Info

Name: John Matthews

Title: Env. Engineer

Company Name: Philips 66

Phone #: (310) 952-6213 Fax #:

Email: John.Matthews@p66.com

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Form 400-E-18
Storage Tank

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Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): Phillips 66 Los Angeles Refinery, Carson Plant

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 171109

Address where the equipment will be operated (for equipment which will be moved to various locations in AQMD's jurisdiction, please list the initial location site): 1520 East Sepulveda Boulevard, Carson, CA 90745

(•) Fixed Location ( ) Various Locations

Tank Type (Select ONE)

( ) External Floating Roof Tank (EFRT) ( ) Internal Floating Roof Tank (IFRT) ( ) Horizontal Tank (HT)
( ) Vertical Fixed Roof Tank (VFRT) (•) Domed External Roof Tank (DEFRT)

Identification

Tank Identification Number: R-510

Tank Contents/Product (include MSDS): Crude Oil with 11 RVP

Section B - Tank Information

Tank Characteristics

Shell Diameter (ft.): 218

Shell Length (ft.):

Shell Height (ft.): 50

Turnovers Per Year: 64

Is Tank Heated? ( ) Yes (•) No

Is Tank Underground? ( ) Yes (•) No

Net Throughput (gal/year): 756MM

Self Support Roof: (•) Yes ( ) No

Number of Columns? 0

Effective Column Diameter: ( ) 9" by 7" Built Up Column - 1.1 ( ) 8" Diameter Pipe - 0.7 ( ) Unknown - 1

External Shell Condition: (•) Good ( ) Poor

Internal Shell Color: (•) Light Rust ( ) Dense Rust ( ) Gunite Lining

External Shell Color: (•) White/White ( ) Aluminum/Specular ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Gray/Medium ( ) Red/Primer

Average Liquid Height (ft.) (Vertical Only): 25

Maximum Liquid Height (ft.) (Vertical Only): 43

Working Volume (gal.) (Vertical Only): 11970000

Actual Volume (gal.) (Vertical Only): 13440000

Paint Condition: (•) Good ( ) Poor

Paint Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Roof Characteristics (Floating Roof Tank)

Roof Type: ( ) Pontoon ( ) Double Deck (•) Dome Roof (Height 42 ft.) ( ) Cone Roof (Height ____ ft.)

Roof Fitting Category: ( ) Typical (•) Detail

Roof Height (ft.):

Roof Paint Condition: (•) Good ( ) Poor

Roof Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Deck Characteristics (Floating Roof Tank)

Deck Type: (•) Welded ( ) Bolted

Deck Fitting Characteristics: ( ) Typical ( ) Detailed (Complete Deck Seam)

Construction: ( ) Sheet ( ) Panel

Deck Seam Length (ft.):

Deck Seam: ( ) 5 ft. wide ( ) 6 ft. wide ( ) 7 ft. wide ( ) 5 x 7.5 ft. ( ) 5 x 12 ft.

Tank Construction and Rim -Seal System (Floating Roof Tank)

Tank Construction: (•) Welded ( ) Riveted

Primary Seal: (•) Mechanical Shoe ( ) Liquid Mounted ( ) Vapor Mounted

Secondary Seal: (•) Rim Mounted ( ) None ( ) Shoe Mounted

Breather Vent Setting

Vacuum Setting (psig):

Pressure Setting (psig):

* Section D of the application MUST be completed.

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Storage Tank

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Tel: (909) 396-3385
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Section B - Tank Information (cont.)

Site Selection

Nearest Major City: Long Beach

Daily Average Ambient Temperature (°F): 64.31 Annual Average Minimum Temperature (°F): 54.40

Annual Average Maximum Temperature (°F): 74.22 Average Wind Speed (mph): 6.36

Annual Average Solar Insulation Factor (Btu / (ft^3 * ft * day)): 1571.65

Tank Contents

Chemical Category: ○ Organic Liquids ◉ Crude Oil ○ Petroleum Distillates

Liquid: ○ Single ◉ Multiple

If Multiple, Select Speciation Option: ○ Full Speciation ◉ Partial Speciation ○ Various Weight Speciation ○ None

Section C - Operation Information

Vapor Control

Vapor Control During Loading or Unloading: ☐ Sparger ☐ Vapor Balance System ☐ Vapor Return Line ☐ Vented to Air Pollution Control Equipment [1]

[1] A separate permit is required. If APC equipment is already permitted, provide Permit or Device Number: _____

Vent Valve Data

Indicate Type of Setting and Vapor Disposal

	Number	Pressure Setting	Vaccum Setting	Discharging to (Check Appropriate Box)		
				Atmosphere	Vapor Control	Flare
Combination				☐	☐	☐
Pressure				☐	☐	☐
Vaccum				☐	☐	☐
Open				☐	☐	☐

Materials

Name all liquids, vapors, gases, or mixtures of such material to be stored in this tank:

Crude Oil

If material is stored in a solution, supply the following information:

Name of Solvent: _____ Name of Materials Dissolved: _____

Concentration of Materials Dissolved: _____ % by Weight OR _____ % by Volume OR _____ lbs/gal

Section D - Roof/Deck Fitting

Section D is required for the following tanks: External Floating Roof Tank, Internal Floating Roof Tanks, or Domed External Floating Roof Tanks.

Select the number of fittings for each applicable question. Examples: 3 Unbolted Cover, Ungasketed
_____ Unbolted Cover, Gasketed

Roof/Deck Fitting Details

1. Access Hatch (24" diameter well)	2. Automatic Gauge Float Well (20" diameter well)	3. Column Well (24" diameter well)
2 Bolted Cover, Gasketed	2 Bolted Cover, Gasketed	_____ Built-Up Col - Sliding Cover, Gasketed
_____ Unbolted Cover, UnGasketed	_____ Unbolted Cover, Ungasketed	_____ Built-Up Col - Sliding Cover, Ungasketed
_____ Unbolted Cover, Gasketed	_____ Unbolted Cover, Gasketed	_____ Pipe Col - Flex, Fabric Sleeve Seal
		_____ Pipe Col - Sliding Cover, Gasketed
		_____ Pipe Col - Sliding Cover, Ungasketed

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Section D - Roof/Deck Fitting (cont.)

Roof/Deck Fitting Details (cont.)

4. Gauge Hatch/Sample Well (8" diameter well)
- 1 Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

5. Ladder Well (36" diameter)
- 1 Sliding Cover, Gasketed
- ____ Sliding Cover, Ungasketed

6. Rim Vent (6" diameter)
- ____ Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

7. Roof Drain (3" diameter)
- ____ Open
- 1 90% Close

8. Roof Leg (3" diameter leg)
- ____ Adjustable, Pontoon Area, Ungasketed
- ____ Adjustable, Center Area, Ungasketed
- ____ Adjustable, Double-Deck Roofs
- ____ Fixed
- 34 Adjustable, Pontoon Area, Gasketed
- ____ Adjustable, Pontoon Area, Sock
- 77 Adjustable, Center Area, Gasketed
- ____ Adjustable, Center Area, Sock

9. Roof Leg or Hang Well
- ____ Adjustable
- ____ Fixed

10. Sample Pipe (24" diameter)
- ____ Slotted Pipe – Sliding Cover, Gasketed
- ____ Slotted Pipe – Sliding Cover, Ungasketed
- ____ Slit Fabric Seal, 10% Open

11. Guided Pole/Sample Well
- ____ Ungasketed, Sliding Cover, Without Float
- ____ Ungasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, Without Float
- ____ Gasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, With Pole Sleeve
- ____ Gasketed Sliding Cover, With Pole Wiper
- ____ Gasketed Sliding Cover, With Float, Wiper
- ____ Gasketed Sliding Cover, With Float, Sleeve, Wiper
- ____ Gasketed Sliding Cover, With Pole Sleeve, Wiper

12. ____ Stub Drain (1" diameter)

13. Unslotted Guide – Pole Well
- ____ Ungasketed, Sliding Cover
- ____ Gasketed Sliding Cover
- ____ Ungasketed Sliding Cover with Sleeve
- ____ Gasketed Sliding Cover with Sleeve
- 1 Gasketed Sliding Cover with Wiper

14. Vacuum Breaker (10" diameter well)
- 2 Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: Marcia Baver Date: 4/26/13

Name: Marcia Baverman

Title: Project Manager

Company Name: EAI

Phone #: (714) 632-8521 Fax #: (714) 632-6754

Email: mbaverman@envaudit.com

Contact Info

Name: John Matthews

Title: Env. Engineer

Company Name: Philips 66

Phone #: (310) 952-6213 Fax #:

Email: John.Matthews@p66.com

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Address where the equipment will be operated (for equipment which will be moved to various locations in AQMD's jurisdiction, please list the initial location site): 1520 East Sepulveda Boulevard, Carson, CA 90745

(•) Fixed Location ( ) Various Locations

Tank Type (Select ONE)

( ) External Floating Roof Tank (EFRT) ( ) Internal Floating Roof Tank (IFRT) ( ) Horizontal Tank (HT)
( ) Vertical Fixed Roof Tank (VFRT) (•) Domed External Roof Tank (DEFRT)

Identification

Tank Identification Number: R-511

Tank Contents/Product (include MSDS): Crude Oil with 11 RVP

Section B - Tank Information

Tank Characteristics

Shell Diameter (ft.): 218

Shell Length (ft.):

Shell Height (ft.): 50

Turnovers Per Year: 64

Is Tank Heated? ( ) Yes (•) No

Is Tank Underground? ( ) Yes (•) No

Net Throughput (gal/year): 756MM

Self Support Roof: (•) Yes ( ) No

Number of Columns? 0

Effective Column Diameter: ( ) 9" by 7" Built Up Column - 1.1 ( ) 8" Diameter Pipe - 0.7 ( ) Unknown - 1

External Shell Condition: (•) Good ( ) Poor

Internal Shell Color: (•) Light Rust ( ) Dense Rust ( ) Gunite Lining

External Shell Color: (•) White/White ( ) Aluminum/Specular ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Gray/Medium ( ) Red/Primer

Average Liquid Height (ft.) (Vertical Only): 25

Maximum Liquid Height (ft.) (Vertical Only): 43

Working Volume (gal.) (Vertical Only): 11970000

Actual Volume (gal.) (Vertical Only): 13440000

Paint Condition: (•) Good ( ) Poor

Paint Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Roof Characteristics (Floating Roof Tank)

Roof Type: ( ) Pontoon (•) Dome Roof (Height 42 ft.) ( ) Double Deck ( ) Cone Roof (Height ____ ft.)

Roof Fitting Category: ( ) Typical (•) Detail

Roof Height (ft.):

Roof Paint Condition: (•) Good ( ) Poor

Roof Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Deck Characteristics (Floating Roof Tank)

Deck Type: (•) Welded ( ) Bolted

Deck Fitting Characteristics: ( ) Typical ( ) Detailed (Complete Deck Seam)

Construction:	Deck Seam Length (ft.):	Deck Seam:
( ) Sheet		( ) 5 ft. wide ( ) 6 ft. wide ( ) 7 ft. wide
( ) Panel		( ) 5 x 7.5 ft. ( ) 5 x 12 ft.

Tank Construction and Rim -Seal System (Floating Roof Tank)

Tank Construction: (•) Welded ( ) Riveted

Primary Seal: (•) Mechanical Shoe ( ) Liquid Mounted ( ) Vapor Mounted

Secondary Seal: (•) Rim Mounted ( ) None ( ) Shoe Mounted

Breather Vent Setting

Vacuum Setting (psig):

Pressure Setting (psig):

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Section B - Tank Information (cont.)

Site Selection

Nearest Major City: Long Beach

Daily Average Ambient Temperature (°F): 64.31 Annual Average Minimum Temperature (°F): 54.40

Annual Average Maximum Temperature (°F): 74.22 Average Wind Speed (mph): 6.36

Annual Average Solar Insulation Factor (Btu / (ft^3 * ft * day)): 1571.65

Tank Contents

Chemical Category: ○ Organic Liquids ◉ Crude Oil ○ Petroleum Distillates

Liquid: ○ Single ◉ Multiple

If Multiple, Select Speciation Option: ○ Full Speciation ◉ Partial Speciation

○ Various Weight Speciation ○ None

Section C - Operation Information

Vapor Control

Vapor Control During Loading or Unloading: ☐ Sparger ☐ Vapor Balance System ☐ Vapor Return Line

☐ Vented to Air Pollution Control Equipment [1]

[1] A separate permit is required. If APC equipment is already permitted, provide Permit or Device Number: _____

Vent Valve Data

Indicate Type of Setting and Vapor Disposal

	Number	Pressure Setting	Vaccum Setting	Discharging to (Check Appropriate Box)		
				Atmosphere	Vapor Control	Flare
Combination				☐	☐	☐
Pressure				☐	☐	☐
Vaccum				☐	☐	☐
Open				☐	☐	☐

Materials

Name all liquids, vapors, gases, or mixtures of such material to be stored in this tank:

Crude Oil

If material is stored in a solution, supply the following information:

Name of Solvent: _____ Name of Materials Dissolved: _____

Concentration of Materials Dissolved: _____ % by Weight OR _____ % by Volume OR _____ lbs/gal

Section D - Roof/Deck Fitting

Section D is required for the following tanks: External Floating Roof Tank, Internal Floating Roof Tanks, or Domed External Floating Roof Tanks.

Select the number of fittings for each applicable question. Examples: 3 Unbolted Cover, Ungasketed

_____ Unbolted Cover, Gasketed

Roof/Deck Fitting Details

1. Access Hatch (24" diameter well)	2. Automatic Gauge Float Well (20" diameter well)	3. Column Well (24" diameter well)
2 Bolted Cover, Gasketed	2 Bolted Cover, Gasketed	_____ Built-Up Col - Sliding Cover, Gasketed
_____ Unbolted Cover, UnGasketed	_____ Unbolted Cover, Ungasketed	_____ Built-Up Col - Sliding Cover, Ungasketed
_____ Unbolted Cover, Gasketed	_____ Unbolted Cover, Gasketed	_____ Pipe Col - Flex, Fabric Sleeve Seal
		_____ Pipe Col - Sliding Cover, Gasketed
		_____ Pipe Col - Sliding Cover, Ungasketed

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South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Section D - Roof/Deck Fitting (cont.)

Roof/Deck Fitting Details (cont.)

4. Gauge Hatch/Sample Well (8" diameter well)
- 1 Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

5. Ladder Well (36" diameter)
- 1 Sliding Cover, Gasketed
- ____ Sliding Cover, Ungasketed

6. Rim Vent (6" diameter)
- ____ Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

7. Roof Drain (3" diameter)
- ____ Open
- 1 90% Close

8. Roof Leg (3" diameter leg)
- ____ Adjustable, Pontoon Area, Ungasketed
- ____ Adjustable, Center Area, Ungasketed
- ____ Adjustable, Double-Deck Roofs
- ____ Fixed
- 34 Adjustable, Pontoon Area, Gasketed
- ____ Adjustable, Pontoon Area, Sock
- 77 Adjustable, Center Area, Gasketed
- ____ Adjustable, Center Area, Sock

9. Roof Leg or Hang Well
- ____ Adjustable
- ____ Fixed

10. Sample Pipe (24" diameter)
- ____ Slotted Pipe – Sliding Cover, Gasketed
- ____ Slotted Pipe – Sliding Cover, Ungasketed
- ____ Slit Fabric Seal, 10% Open

11. Guided Pole/Sample Well
- ____ Ungasketed, Sliding Cover, Without Float
- ____ Ungasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, Without Float
- ____ Gasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, With Pole Sleeve
- ____ Gasketed Sliding Cover, With Pole Wiper
- ____ Gasketed Sliding Cover, With Float, Wiper
- ____ Gasketed Sliding Cover, With Float, Sleeve, Wiper
- ____ Gasketed Sliding Cover, With Pole Sleeve, Wiper

12. ____ Stub Drain (1" diameter)

13. Unslotted Guide – Pole Well
- ____ Ungasketed, Sliding Cover
- ____ Gasketed Sliding Cover
- ____ Ungasketed Sliding Cover with Sleeve
- ____ Gasketed Sliding Cover with Sleeve
- 1 Gasketed Sliding Cover with Wiper

14. Vacuum Breaker (10" diameter well)
- 2 Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: Marcia Baverman Date: 9/26/13

Title: Project Manager

Company Name: Environmenal Audit Inc.

Name: Marcia Baverman

Phone #: (714) 632-8521 Fax #: (714) 632-6754

Email: mbaverman@envaudit.com

Contact Info

Name: John Matthews

Title: Env. Engineer

Company Name: Philips 66

Phone #: (310) 952-6213 Fax #:

Email: John.Matthews@p66.com

THIS IS A PUBLIC DOCUMENT

Pursuant to the California Public Records Act, your permit application and any supplemental documentation are public records and may be disclosed to a third party. If you wish to claim certain limited information as exempt from disclosure because it qualifies as a trade secret, as defined in the District's Guidelines for Implementing the California Public Records Act, you must make such claim at the time of submittal to the District.

Check here if you claim that this form or its attachments contain confidential trade secret information. ☒

AQMD Form 400-E-GI

Philips 66 – Los Angeles Refinery Carson Plant
Facility ID No. 171109

Permit Application

Supplemental Information Package
Crude Oil Storage Capacity Project Tanks

Sections

1. Company Information
2. Background
3. Project Description
4. Equipment Location and Description
5. Operating Schedule
6. Emission Calculations
7. Evaluation and Rule Review
8. Proposed Permit Conditions
9. Confidentiality

Attachments

A Figures
B Emission Calculations
C Tank R510 NSR Balance
D Rule 1401 Analyses

April 26, 2013

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1. COMPANY INFORMATION

Mailing Address
1660 W. Anaheim St.
Wilmington, CA 90744

Site Location
Carson Plant
1520 E. Sepulveda Blvd.
Carson, CA 90745

2. BACKGROUND

The Philips 66 Los Angeles Refinery Carson Plant (LARC) operates crude supply storage tanks to handle incoming crude supplies from domestic as well as various sources from the Port of Long Beach, Berth 121.

LARC currently has four 320,000 barrel (BBL) receiving tanks (285,000 BBL net working capacity) for crude. These tanks usually store three segregated crude grades at a time, which essentially limits delivery volumes to Panamax vessels (400,000 BBL capacity). For larger vessels, such as Aframax (720,000 BBL) or Suezmax (1,000,000 BBL), LARC requires two ship calls to unload the full volume of the vessels, resulting in seven to 10 days of demurrage between ship calls. Between ship calls LARC makes room in the receiving tanks to accommodate the second discharge from the larger vessel. LARC needs more tankage and capacity to accommodate the larger vessels so they can discharge their total volume in one call.

3. PROJECT DESCRIPTION

The project will increase the onsite crude storage capacity by installing one new 614,656 BBL (500,141 BBL net working capacity) domed external floating roof crude tank (Tank 2640) and geodesic domes on two of the existing crude tanks (Tank R510 (Device D394) and Tank R511(Device D395)). The project also includes the construction of a new 13,971 BBL (10,035 BBL net working capacity) domed external floating roof water draw tank (Tank 2643).

Currently, the water draw from the existing crude tanks is processed in the sour water stripper which is at times overloaded. The water draw from the existing R510 and R511 tanks and new Tank 2640 will be routed to the new water draw Tank 2643. The new 10,035 BBL water draw tank will allow LARC to treat the water at the Brine Stripper, which has excess capacity. Minor modifications are required to prepare the water draw from Tank 2643 for delivery to the Brine Stripper, consisting of the installation of new heat exchangers and a steam trim heater to raise the temperature of the water before entering the Brine Stripper.

4. EQUIPMENT LOCATION AND TANK DESCRIPTION

The new tanks and tank modifications will be located at the western boundary of LARC. Table 1 shows the specifications of the existing and proposed tanks. Please refer to the Figures 1, 2, and 3 in Attachments A for locations.

TABLE 1
Tank Specifications

Tank Number	Roof Type	Commodity Type	Working Volume (BBL)	Diameter (ft)	Height (ft)	Dome Roof (ft)
Existing 510	Pontoon	Crude Oil	285,000	218	50	42
Existing 511	Pontoon	Crude Oil	285,000	218	50	42
Modified 510	Domed	Crude Oil RVP 7	285,000	218	50	42
Modified 511	Domed	Crude Oil RVP 7	285,000	218	50	42
New Tank 2640	Domed	Crude Oil RVP 7	500,141	260	65	53
New Tank 2643	Domed	Water/Crude	10,035	44	52	7

5. OPERATING SCHEDULE

	NORMAL	MAXIMUM
Hours/Day	24	24
Days/Week	7	7
Weeks/Year	52	52

6. EMISSION CALCULATIONS

The emissions for the tanks were calculated with the EPA TANKS 4.0.9d emissions model using a crude speciation for crude oil with a Reid Vapor Pressure of 11 (true vapor pressure 11 at 77 °F, see Figure 4). The peak daily emission rate was calculated by taking the maximum monthly value and converting to a daily rate. The new tanks will both use 4" legs instead of the standard 3" legs. Since there are no established emission factors for non-standard sized legs, emissions were scaled based on the difference in circumference between the 3" legs and 4" legs. The fugitive emissions from components were calculated using the SCAQMD correlation equations. The emission calculations can be found in Attachment B.

7. EVALUATION AND RULE REVIEW

The proposed Project is designed to comply with the standards contained in the applicable State and Federal Rules and Regulations. The following provides a brief summary of the applicable regulations.

STATE REGULATIONS

Rule 301 – Permit Fees

Per the requirements of SCAQMD Rule 301, the application fee for the tanks is $12,040.21 (Schedule C – Storage Tank, with External Floating Roof). Expedited permit processing has been requested and an additional $6,020.11 will be submitted with the permit application fee. The total application and expedited fee for the permit application is $19,849.44.

Rule 403 – Fugitive Dust

The construction activities of the proposed project are regulated under SCAQMD Rule 403 which include requirements to minimize fugitive dust using best available control measures that include applying water or chemical stabilizers to active construction sites/unpaved roads, covering all haul vehicles, and so forth.

Rule 463 – Organic Liquid Storage

The crude storage tanks are regulated under SCAQMD Rule 463, which includes requirements to minimize fugitive VOC using best available control measures that include tanks construction standards.

Rule 466 – Pumps and Compressors

Rule 466 establishes inspection, tagging, and maintenance requirements for pumps and compressors. Pumps and compressors associated with all tanks will be included in the LARC Rule 1173 compliance program and will, therefore, comply with Rule 466.

Rule 466.1 – Valves and Flanges

Rule 466.1 establishes inspection, tagging, and maintenance requirements for valves and flanges. Valves and flanges associated with all tanks will be included in the LARC Rule 1173 monitoring program and will, therefore, comply with Rule 466.1.

Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants

The LARC currently complies with Rule 1173 and has a monitoring program for leaks. The new tanks will be incorporated into the existing plan.

Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities

Rule 1178 establishes tanks standards to control fugitive VOC emissions. The new and modified tanks associated with proposed Project will comply with Rule 1178.

Regulation XIII – New Source Review

The tanks are subject to Regulation XIII and are subject to requirements to provide emission offsets. Tanks R510 and R511 were permitted pursuant to Rule 213 with an NSR for Tank R510 identified as 103.7 lbs/day (See Attachment C). Since Tank R511 is identical to Tank R510, the total NSR balance for the tanks should be 207.4 lbs/day Pursuant to Rule 1304(c)(2) a concurrent emissions reduction can be used in lieu of providing offsets for the new equipment. As shown in Table 2, no additional offsets are required for this project.

TABLE 2
Emission Reduction Credits Summary

Tank No.	Emissions (lbs/day)
Post Project Emissions	
Modified Tank 510 Crude Tank	17.04
Modified Tank 511 Crude Tank	17.04
New Tank 2640 Crude Tank	18.78
New Tank 2643 Water Draw Tank	4.21
Fugitive Emissions	9.07
Total Project Emissions	66.13
NSR Balance for Tanks 510 and 511	207.4
Offsets Required	0

Rule 1401 – New Source Review for Toxic Air Contaminants

The tanks will store crude oil which contains chemicals listed under SCAQMD Rule 1401 and considered to be toxic air contaminants. The increase in toxic air contaminants is below the Rule 1401 screening thresholds for each of the four tanks. The Rule 1401 screening analyses are included in Attachment D.

Regulation XX - RECLAIM

The facility is subject to RECLAIM, however, the project only generates VOC emissions, which is not a RECLAIM pollutant. Therefore, no RECLAIM emissions are emitted from this project.

Regulation XXX - Title V Permits

The facility is a Title V facility. Permit modification applications are included in this application package to modify the facility Title V permit. The Title V permit modification qualifies as a significant permit revision pursuant to SCAQMD Rule 3000(b)(31)(I).

FEDERAL REGULATIONS

The federal regulations applicable to the new tanks are as follows:

40 CFR 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984

40 CFR 60 Subpart GGGa – Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After November 7, 2006

40 CFR 61 Subpart V – National Emission Standards for Equipment Leaks (Fugitive Emission Sources)

40 CRF 61 subpart FF – National Emission Standards for Benzene Waste Operations

40 CFR 63 Subpart H – National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks

40 CFR 63 Subpart CC – National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries

The federal regulations, while not identical to the state regulations, are similar to state regulations. The new and modified tanks are designed to comply with BACT requirements, the SCAQMD rules and regulations, and federal regulations. Therefore, the new and modified tanks are expected to comply with applicable subparts of the federal regulations.

8. PROPOSED PERMIT CONDITIONS

Below are the proposed permit conditions for throughput and monitoring of the tanks. These conditions should replace condition C1.17 for existing Tanks 510 and 511, and should read:

The operator shall limit the throughput to no more than 1,500,000 barrel(s) in any one calendar month.

The operator shall calculate the throughput, in barrels, by the following equation:

0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The operator shall keep adequate records to show compliance with the limitations specified in this permit.

The conditions for new Tank 2640 should read:

The operator shall limit the throughput to no more than 2,500,000 barrel(s) in any one calendar month.

The operator shall calculate the throughput, in barrels, by the following equation:

0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The operator shall keep adequate records to show compliance with the limitations specified in this permit.

The conditions for new Tanks 2643 should read:

The operator shall limit the throughput to no more than 64,000 barrel(s) in any one calendar month.

The operator shall calculate the throughput, in barrels, by the following equation:

0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The operator shall keep adequate records to show compliance with the limitations specified in this permit.

9. CONFIDENTIALITY

Certain information supplied on the attached sheets concerning process operating conditions, material balances, and process descriptions constitutes confidential and proprietary information under Government Code Section 6254.7. Philips 66 justifies classification of such data as trade secrets because the information contains production data and operating procedures, and therefore would potentially release competitively sensitive information, which would be of considerable value to competitors. Therefore, we request that all such data be handled in confidence.

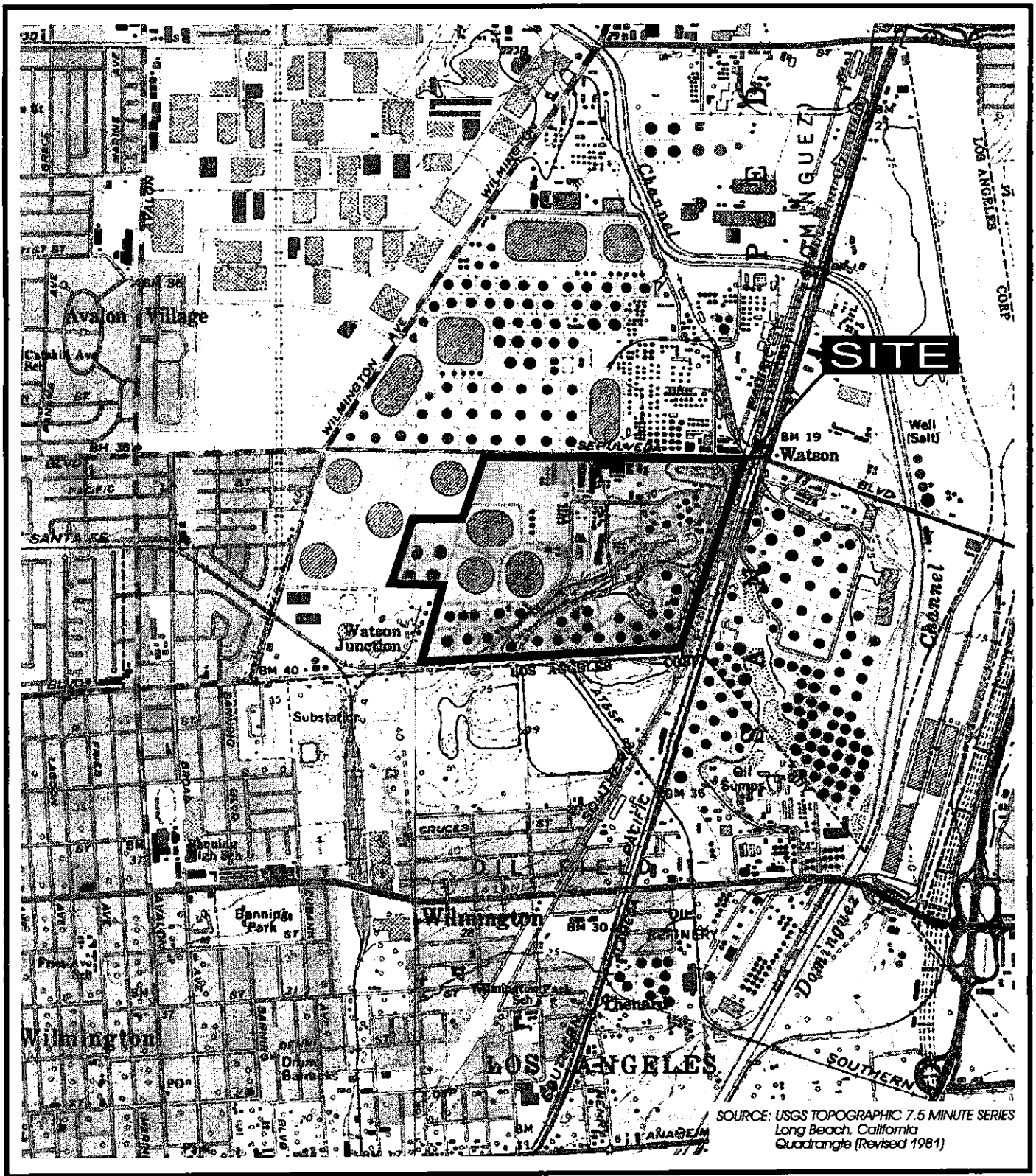
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ATTACHMENT A

Figures

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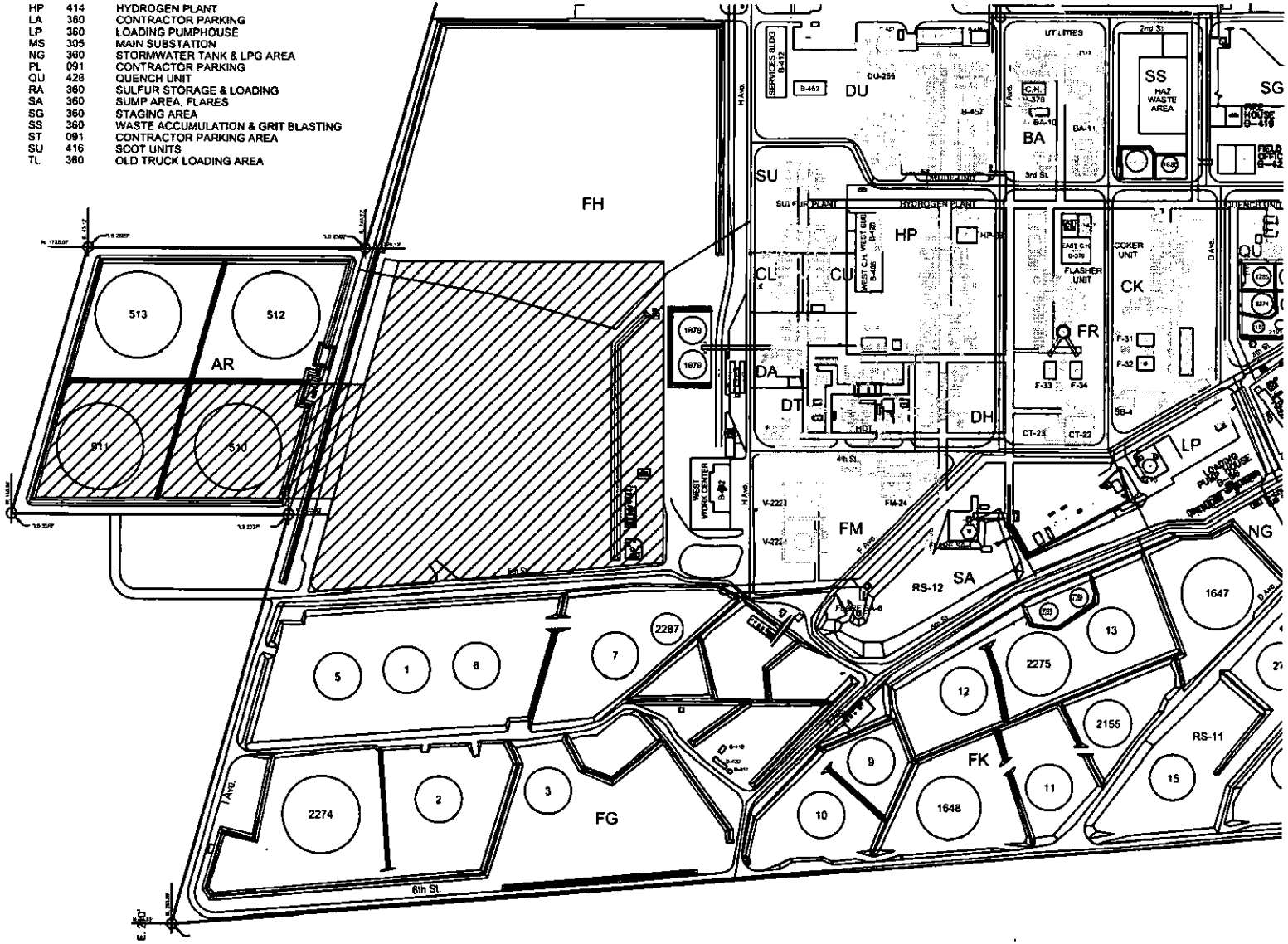
SITE LOCATION MAP
Phillips 66 Los Angeles Refinery
Carson Plant

Project No. 2778

Figure 1

N:\2778\SiteLocMap (Carson).cdr

HP	414	HYDROGEN PLANT
LA	360	CONTRACTOR PARKING
LP	360	LOADING PUMPHOUSE
MS	305	MAIN SUBSTATION
NG	360	STORMWATER TANK & LPG AREA
PL	091	CONTRACTOR PARKING
QU	426	QUENCH UNIT
RA	360	SULFUR STORAGE & LOADING
SA	360	SUMP AREA, FLARES
SG	360	STAGING AREA
SS	360	WASTE ACCUMULATION & GRIT BLASTING
ST	091	CONTRACTOR PARKING AREA
SU	416	SCOT UNITS
TL	360	OLD TRUCK LOADING AREA



LEGEND:

(13) NUMBERS IN AND AROUND OBJECTS REPRESENT INDIVIDUAL TANK NUMBERS

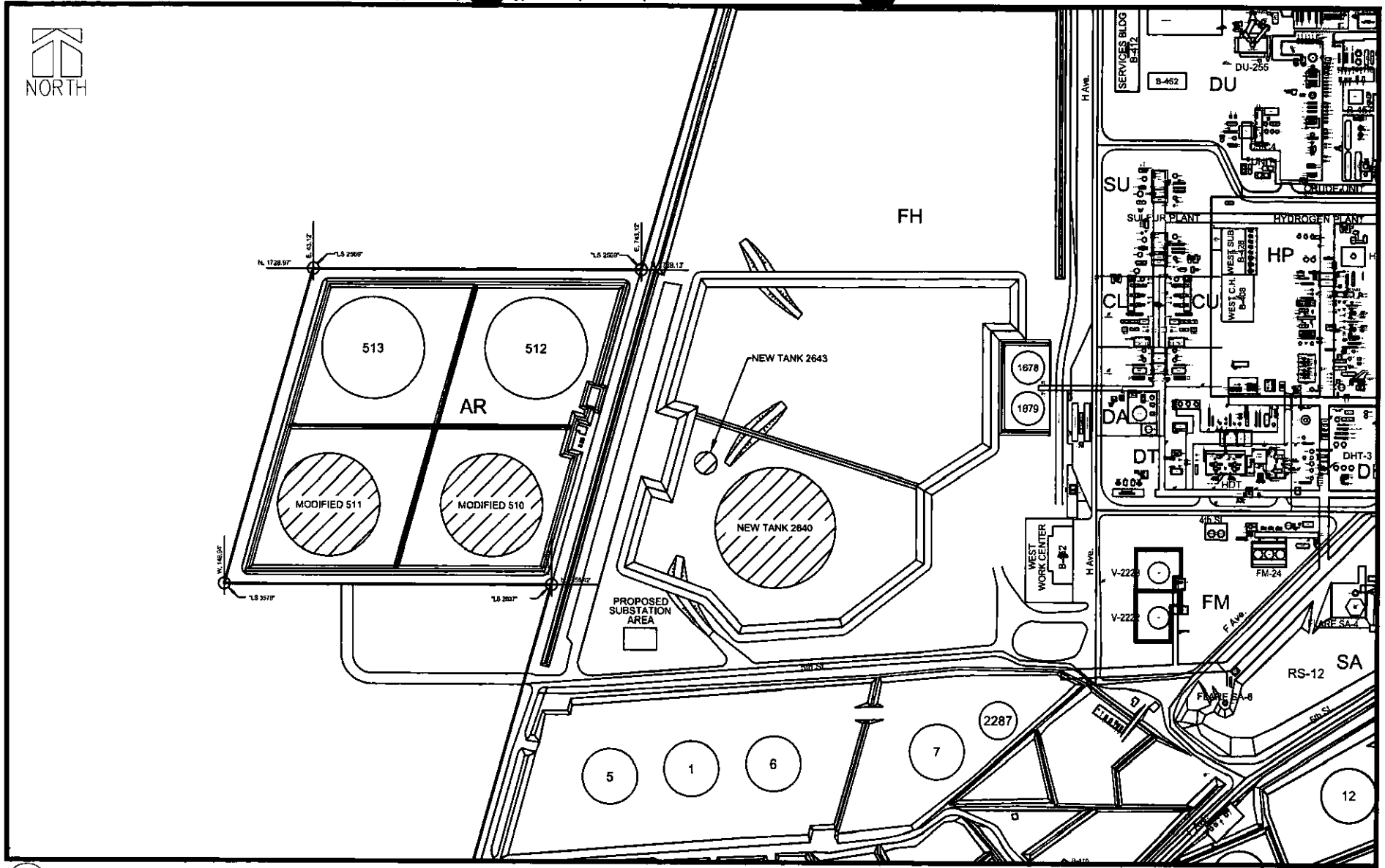
PROPOSED PROJECT AREA

NORTH

0 400'

SCALE

I:\2778\Proposed Project (rev.6a) **(Created)** 11/19/03 **(Drawn By)** A.S.K. **(C By)** S.A.B. **(Last Rev.)** 03/08/13



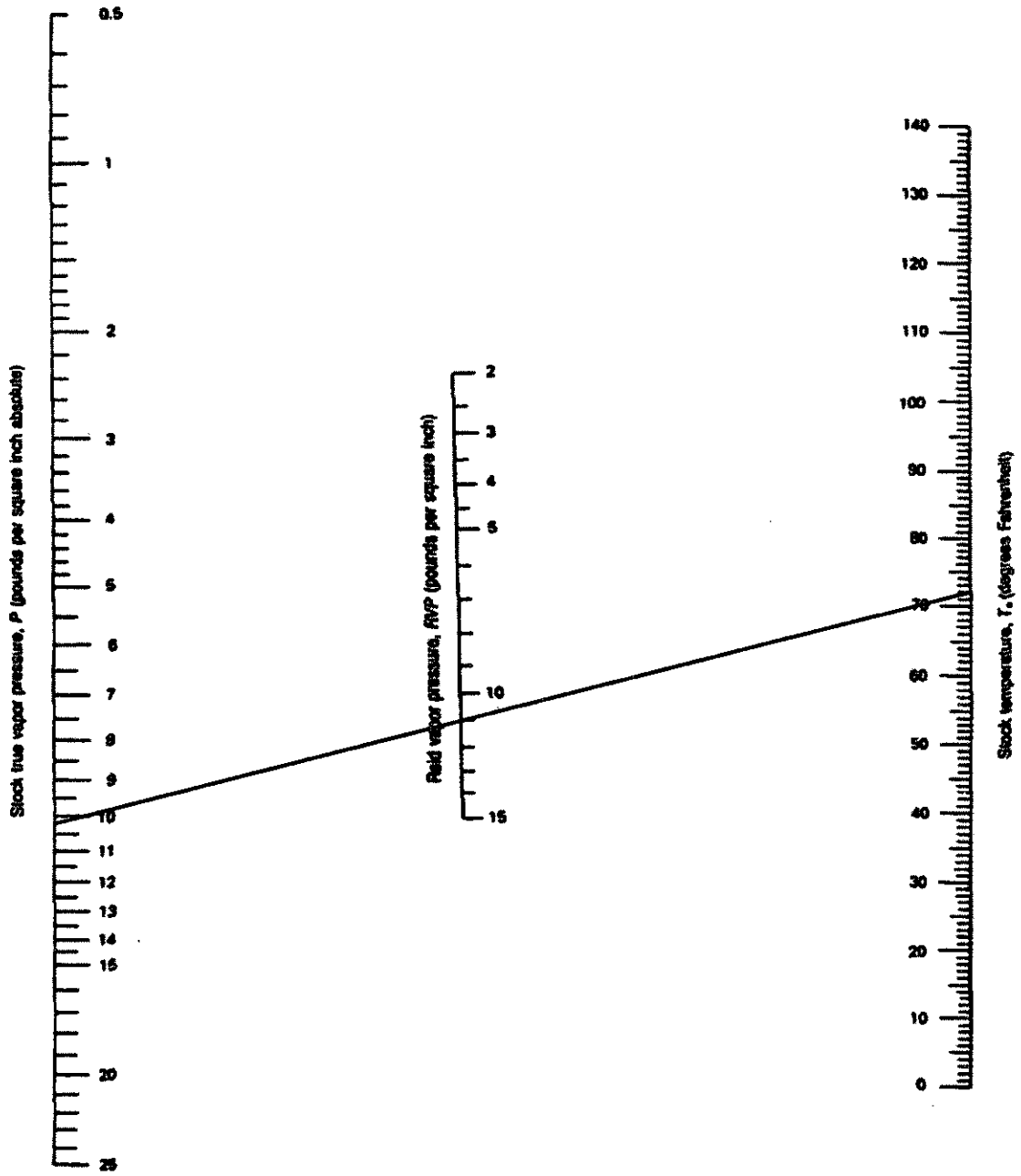
Environmental Audit, Inc.

0 300'

PROPOSED PROJECT PLAN
Phillips 66 Los Angeles Refinery
Carson Plant

Project No. 2778

Figure 3



True vapor pressure of crude oils with a Reid vapor pressure of 2 to 15 pounds per square inch.

SOURCE: AP42 Figure 7.1-13a (November 2006)

Environmental Audit, Inc.

Nomograph of Crude Oil Vapor Pressure

Project No. 2778

Figure 4

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ATTACHMENT B

Emission Calculations

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Attachment B
Emissions Calculations

Phillips 66 Carson Plant
Crude Oil Capacity Project

Component Count

Process Unit: **Philips 66 Carson Plant New Crude Tank 2640**

Source		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm) Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	190	0.00	0	0
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	14	4.55	0	63.64
		Light Liquid (4)	0	0	83	4.55	0	377.30
		Heavy Liquid (5)	0	0		4.55	0	-
		> 8 Inches	0	0			0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	5	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	2	46.83	0	
Compressors		Gas / Vapor	0	0		9.09	-	
Flanges (ANSI 16.5-1988)		All	0	0	258	6.99	-	1,803.47
Connectors		All	0	0	134	2.86	-	383.43
Pressure Relief Valves		All	0	0	6		0	-
Process Drains with P-Trap or Seal Pot		All	0	0	0	9.09	-	
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	7	9.09	-	
Total Emissions		lb/year					-	2,628
		lbs/day					0	7.20

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Attachment B
Emissions Calculations

Phillips 66 Carson Plant
Crude Oil Capacity Project

Component Count

Process Unit: Philips 66 Carson Plant New Crude Tank 2643

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm) Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	61	0.00	0	0
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	0	4.55	0	-
		Light Liquid (4)	0	0	16	4.55	0	72.73
		Heavy Liquid (5)	0	0	0	4.55	0	-
		> 8 inches	0	0	0		0	-
Pumps	Seallass Type	Light Liquid (4)	0	0	0	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	0	46.83	0	
Compressors		Gas / Vapor	0	0	0	9.09	-	
Flanges (ANSI 16.5-1988)		All	0	0	79	6.99	-	552.22
Connectors		All	0	0	20	2.86	-	57.23
Pressure Relief Valves		All	0	0	0		0	-
Process Drains with P-Trap or Seal Pot		All	0	0	0	9.09	-	
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	1	9.09	-	
Total Emissions		lb/year					-	682
		lbs/day					0	1.87

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Fugitive Component Emissions

		Tank 2640			Tank 2643		
Chemical	Crude Vapor Wt%	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	2.83	7.44E+01	0.20	8.50E-03	19.33	0.05	2.21E-03
PACs (Chrysene)	0.00	3.56E-05	0.00	4.06E-09	9.24E-06	0.00	1.06E-09
Cresol (mixed isomers)	0.00	4.28E-05	0.00	4.89E-09	1.11E-05	0.00	1.27E-09
Ethylbenzene	0.13	3.29E+00	0.01	3.76E-04	8.55E-01	0.00	9.76E-05
n-Hexane	38.55	1012.95	2.78	1.16E-01	262.96	0.72	3.00E-02
Naphthalene	0.00	2.26E-02	0.00	2.58E-06	5.87E-03	0.00	6.71E-07
Phenol	0.00	1.02E-04	0.00	1.16E-08	2.64E-05	0.00	3.01E-09
Toluene	1.01	2.66E+01	0.07	3.04E-03	6.90	0.02	7.88E-04
Xylene (mixed isomers)	0.19	5.09E+00	0.01	5.81E-04	1.32E+00	0.00	1.51E-04
Cumene	0.00	7.03E-03	0.00	8.02E-07	0.00	0.00	2.08E-07
Cyclohexane	19.14	503.08	1.38	5.74E-02	130.60	0.36	1.49E-02
1,2,4-Trimethylbenzene	0.01	3.28E-01	0.00	3.74E-05	8.51E-02	0.00	9.71E-06
Total VOC	100.00	2.63E+03	7.20	3.00E-01	682.18	1.87	7.79E-02

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Tank Working Loss Emissions

	Tank 2640[1]			Tank 2643[1]			Tank R510/R511		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	8.28	0.0227	9.45E-04	1.66	0.0045	1.89E-04	6.96	0.0191	7.945E-04
PACs (Chrysene)	0.09	0.0002	1.03E-05	0.01	0.0000	1.14E-06	0.07	0.0002	7.991E-06
Cresol (mixed isomers)	0.03	0.0001	3.42E-06	-	-	0.00E+00	0.02	0.0001	2.283E-06
Ethylbenzene	7.10	0.0194	8.10E-04	1.11	0.0030	1.27E-04	5.17	0.0142	5.902E-04
n-Hexane	59.02	0.1617	6.74E-03	12.99	0.0356	1.48E-03	52.95	0.1451	6.045E-03
Naphthalene	4.24	0.0116	4.84E-04	0.64	0.0018	7.31E-05	3.03	0.0083	3.459E-04
Phenol	0.01	0.0000	1.14E-06	-	-	0.00E+00	0.01	0.0000	1.142E-06
Toluene	28.79	0.0789	3.29E-03	4.83	0.0132	5.51E-04	21.79	0.0597	2.487E-03
Xylene (mixed isomers)	44.70	0.1225	5.10E-03	6.98	0.0191	7.96E-04	32.47	0.0890	3.707E-03
Cumene	0.12	0.0003	1.37E-05	0.02	0.0001	2.28E-06	0.08	0.0002	9.132E-06
Cyclohexane	42.75	0.1171	4.88E-03	8.42	0.0231	9.61E-04	35.69	0.0978	4.074E-03
1,2,4-Trimethylbenzene	13.09	0.0359	1.49E-03	2.00	0.0055	2.29E-04	9.39	0.0257	1.072E-03
Total VOC	6,634.36	18.1763	7.57E-01	1,465.21	4.0143	1.67E-01	5963.21	16.3376	6.807E-01

(1) Tank leg emissions scaled for 4" legs.

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Total Tank Operational Emissions

	Tank 2640			Tank 2643		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	82.72	0.2266	0.0094	20.98	0.0575	0.0024
PACs (Chrysene)	0.09	0.0002	0.0000	0.01	0.0000	0.0000
Cresol (mixed isomers)	0.03	0.0001	0.0000	0.00	0.0000	0.0000
Ethylbenzene	10.39	0.0285	0.0012	1.96	0.0054	0.0002
n-Hexane	1,071.97	2.9369	0.1224	275.96	0.7560	0.0315
Naphthalene	4.26	0.0117	0.0005	0.65	0.0018	0.0001
Phenol	0.01	0.0000	0.0000	0.00	0.0000	0.0000
Toluene	55.38	0.1517	0.0063	11.73	0.0321	0.0013
Xylene (mixed isomers)	49.79	0.1364	0.0057	8.30	0.0227	0.0009
Cumene	0.13	0.0003	0.0000	0.02	0.0001	0.0000
Cyclohexane	545.83	1.4954	0.0623	139.02	0.3809	0.0159
1,2,4-Trimethylbenzene	13.42	0.0368	0.0015	2.09	0.0057	0.0002
Total VOC	9,262.19	25.3759	1.0573	2,147.39	5.8833	0.2451

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2640 legged2
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	500000 bbl domed tank (working capacity)

Tank Dimensions

Diameter (ft):	260.00
Volume (gallons):	21,005,922.00
Turnovers:	59.98

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	134
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34
Roof Drain (3-in. Diameter)/90% Closed	3

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

2640 legged2 - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4580	N/A	N/A	49.6923	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0085	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6072	N/A	N/A	49.6889	0.9618	0.9851	215.18	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7607	N/A	N/A	49.6854	0.9618	0.9850	215.18	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0087	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0602	N/A	N/A	49.6787	0.9618	0.9847	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3098	N/A	N/A	49.6732	0.9618	0.9844	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5857	N/A	N/A	49.6671	0.9618	0.9841	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9635	N/A	N/A	49.6589	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0215	N/A	N/A	49.6577	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7812	N/A	N/A	49.6629	0.9618	0.9839	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3880	N/A	N/A	49.6715	0.9618	0.9843	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8423	N/A	N/A	49.6836	0.9618	0.9849	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4544	N/A	N/A	49.6924	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2640 legged2 - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	57.6988	59.1515	60.6795	63.7603	66.4370	69.5218	73.9825	74.6934	71.7943	67.2977	61.5048	57.6642
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph) ^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673
Net Throughput (gal/mo.):	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Roof Fitting Losses (lb):	75.1897	77.0828	79.0740	83.0887	86.5768	90.5967	96.4096	97.3360	93.5581	87.6984	80.1495	75.1446
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	519.1558	522.5016	526.0208	533.1163	539.2811	546.3858	556.6594	558.2967	551.6196	541.2634	527.9216	519.0761

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5	6.20	1.20	0.94	155.9194
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	211.2456
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	134	0.53	0.11	0.13	357.2063
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	14.0830
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	32.1898
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34	1.30	0.08	0.65	222.3109
Roof Drain (3-in. Diameter)/90% Closed	3	1.80	0.14	1.10	27.1602

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2640 legged2 - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	784.19	4,635.21	1,021.90	0.00	6,441.30
1,2,4-Trimethylbenzene	0.03	13.04	0.03	0.00	13.09
Benzene	0.68	6.55	0.88	0.00	8.11
Chrysene	0.00	0.09	0.00	0.00	0.09
Cresol (-m)	0.00	0.03	0.00	0.00	0.03
Cumene	0.00	0.11	0.00	0.00	0.12
Cyclohexene	3.31	34.30	4.32	0.00	41.93
Ethylbenzene	0.07	6.92	0.09	0.00	7.08
Hexane (-n)	6.91	41.41	9.01	0.00	57.32
Naphthalene	0.00	4.24	0.00	0.00	4.24
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	0.80	26.76	1.04	0.00	28.59
Unidentified Components	772.03	4,457.98	1,006.06	0.00	6,236.07
Xylenes (mixed isomers)	0.37	43.76	0.48	0.00	44.61

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2640 legless2
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	500000 bbl domed tank (working capacity)

Tank Dimensions

Diameter (ft):	260.00
Volume (gallons):	21,005,922.00
Turnovers:	59.98

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Roof Drain (3-in. Diameter)/90% Closed	3

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

2640 legless2 - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4580	N/A	N/A	49.6923	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0085	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6072	N/A	N/A	49.6889	0.9618	0.9851	215.18	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7607	N/A	N/A	49.6854	0.9618	0.9850	215.18	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0087	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0602	N/A	N/A	49.6787	0.9618	0.9847	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3098	N/A	N/A	49.6732	0.9618	0.9844	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5857	N/A	N/A	49.6671	0.9618	0.9841	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9635	N/A	N/A	49.6589	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0215	N/A	N/A	49.6577	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7812	N/A	N/A	49.6629	0.9618	0.9839	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3880	N/A	N/A	49.6715	0.9618	0.9843	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8423	N/A	N/A	49.6836	0.9618	0.9849	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4544	N/A	N/A	49.6924	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2640 legless2 - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	57.6988	59.1515	60.6795	63.7603	66.4370	69.5218	73.9825	74.6934	71.7943	67.2977	61.5048	57.6642
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph) ^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673
Net Throughput (gal/mo.):	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Roof Fitting Losses (lb):	32.5739	33.3941	34.2567	35.9960	37.5071	39.2486	41.7669	42.1682	40.5315	37.9930	34.7226	32.5544
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	476.5400	478.8129	481.2036	486.0236	490.2114	495.0377	502.0167	503.1289	498.5931	491.5580	482.4948	476.4859

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5	6.20	1.20	0.94	155.9194
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	211.2456
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	14.0830
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	32.1898
Roof Drain (3-in. Diameter)/90% Closed	3	1.80	0.14	1.10	27.1602

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2640 legless2 - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	784.19	4,635.21	442.71	0.00	5,862.11
1,2,4-Trimethylbenzene	0.03	13.04	0.01	0.00	13.08
Benzene	0.68	6.55	0.38	0.00	7.61
Chrysene	0.00	0.09	0.00	0.00	0.09
Cresol (-m)	0.00	0.03	0.00	0.00	0.03
Cumene	0.00	0.11	0.00	0.00	0.12
Cyclohexene	3.31	34.30	1.87	0.00	39.48
Ethylbenzene	0.07	6.92	0.04	0.00	7.03
Hexane (-n)	6.91	41.41	3.90	0.00	52.22
Naphthalene	0.00	4.24	0.00	0.00	4.24
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	0.80	26.76	0.45	0.00	28.00
Unidentified Components	772.03	4,457.98	435.85	0.00	5,665.86
Xylenes (mixed isomers)	0.37	43.76	0.21	0.00	44.34

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2643 legged
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	10000bbl (working capacity) domed water surge tank

Tank Dimensions

Diameter (ft):	44.00
Volume (gallons):	421,470.00
Turnovers:	76.53

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	12
Roof Drain (3-in. Diameter)/90% Closed	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

2643 legged - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4580	N/A	N/A	49.6923	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0085	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6072	N/A	N/A	49.6889	0.9618	0.9851	215.18	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7607	N/A	N/A	49.6854	0.9618	0.9850	215.18	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0087	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0602	N/A	N/A	49.6787	0.9618	0.9847	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3098	N/A	N/A	49.6732	0.9618	0.9844	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5857	N/A	N/A	49.6671	0.9618	0.9841	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9635	N/A	N/A	49.6589	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0215	N/A	N/A	49.6577	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7812	N/A	N/A	49.6629	0.9618	0.9839	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3880	N/A	N/A	49.6715	0.9618	0.9843	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8423	N/A	N/A	49.6836	0.9618	0.9849	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4544	N/A	N/A	49.6924	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2643 legged - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	9.7644	10.0103	10.2688	10.7902	11.2432	11.7652	12.5201	12.6404	12.1498	11.3888	10.4085	9.7586
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317
Net Throughput (gal/mo.):	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000
Roof Fitting Losses (lb):	45.2381	46.3771	47.5751	49.9805	52.0892	54.5078	58.0051	58.5625	56.2895	52.7640	48.2222	45.2110
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	113.4342	114.8190	116.2756	119.2124	121.7641	124.7047	128.9569	129.6346	126.8710	122.5845	117.0624	113.4012

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	16.0949
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	14.0830
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	31.1839
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	211.2456
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	12	0.82	0.53	0.14	49.4918
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	9.0534
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	281.6608

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2643 legged - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	132.71	701.18	614.83	0.00	1,448.72
1,2,4-Trimethylbenzene	0.00	1.97	0.02	0.00	2.00
Benzene	0.11	0.99	0.53	0.00	1.64
Chrysene	0.00	0.01	0.00	0.00	0.01
Cresol (-m)	0.00	0.00	0.00	0.00	0.00
Cumene	0.00	0.02	0.00	0.00	0.02
Cyclohexene	0.56	5.19	2.60	0.00	8.35
Ethylbenzene	0.01	1.05	0.05	0.00	1.11
Hexane (-n)	1.17	6.26	5.42	0.00	12.85
Naphthalene	0.00	0.64	0.00	0.00	0.64
Phenol	0.00	0.00	0.00	0.00	0.00
Toluene	0.13	4.05	0.63	0.00	4.81
Unidentified Components	130.65	674.37	605.30	0.00	1,410.32
Xylenes (mixed isomers)	0.06	6.62	0.29	0.00	6.97

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2643 legless
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	10000bbl (working capacity) domed water surge tank

Tank Dimensions

Diameter (ft):	44.00
Volume (gallons):	421,470.00
Turnovers:	76.53

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Drain (3-in. Diameter)/90% Closed	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

2643 legless - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4580	N/A	N/A	49.6923	0.9616	0.9853	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0556	N/A	N/A	86.1700	0.0089	0.0085	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6072	N/A	N/A	49.6889	0.9618	0.9851	215.18	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7607	N/A	N/A	49.6854	0.9618	0.9850	215.18	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0087	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0602	N/A	N/A	49.6787	0.9618	0.9847	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3098	N/A	N/A	49.6732	0.9618	0.9844	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5857	N/A	N/A	49.6671	0.9618	0.9841	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9635	N/A	N/A	49.6589	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0215	N/A	N/A	49.6577	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7812	N/A	N/A	49.6629	0.9618	0.9839	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3880	N/A	N/A	49.6715	0.9618	0.9843	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8423	N/A	N/A	49.6836	0.9618	0.9849	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4544	N/A	N/A	49.6924	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2643 legless - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	9.7644	10.0103	10.2688	10.7902	11.2432	11.7652	12.5201	12.6404	12.1498	11.3886	10.4085	9.7586
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317
Net Throughput (gal/mo.):	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000
Roof Fitting Losses (lb):	41.5986	42.6460	43.7476	45.9687	47.8985	50.1225	53.3385	53.8510	51.7609	48.5191	44.3426	41.5737
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	109.7947	111.0879	112.4482	115.1906	117.5734	120.3195	124.2903	124.9232	122.3424	118.3396	113.1828	109.7639

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	16.0949
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	14.0830
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	31.1839
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	211.2456
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	9.0534
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	281.6608

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2643 legless - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	132.71	701.18	565.37	0.00	1,399.26
1,2,4-Trimethylbenzene	0.00	1.97	0.02	0.00	1.99
Benzene	0.11	0.99	0.49	0.00	1.59
Chrysene	0.00	0.01	0.00	0.00	0.01
Cresol (-m)	0.00	0.00	0.00	0.00	0.00
Cumene	0.00	0.02	0.00	0.00	0.02
Cyclohexene	0.56	5.19	2.39	0.00	8.14
Ethylbenzene	0.01	1.05	0.05	0.00	1.11
Hexane (-n)	1.17	6.26	4.98	0.00	12.42
Naphthalene	0.00	0.64	0.00	0.00	0.64
Phenol	0.00	0.00	0.00	0.00	0.00
Toluene	0.13	4.05	0.57	0.00	4.76
Unidentified Components	130.65	674.37	556.60	0.00	1,361.62
Xylenes (mixed isomers)	0.06	6.62	0.26	0.00	6.95

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	R510/511
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	285000 bbl tank (working capacity)

Tank Dimensions

Diameter (ft):	218.60
Volume (gallons):	11,970,000.00
Turnovers:	63.16

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Shoe-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	77
Automatic Gauge Float Well/Bolted Cover, Gasketed	2
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

R510/511 - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4580	N/A	N/A	49.6923	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0085	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6072	N/A	N/A	49.6889	0.9618	0.9851	215.18	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7607	N/A	N/A	49.6854	0.9618	0.9850	215.18	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777

Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0087	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0602	N/A	N/A	49.6787	0.9618	0.9847	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3098	N/A	N/A	49.6732	0.9618	0.9844	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5857	N/A	N/A	49.6671	0.9618	0.9841	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9635	N/A	N/A	49.6589	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0215	N/A	N/A	49.6577	0.9618	0.9837	215.18	

Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7812	N/A	N/A	49.6629	0.9618	0.9839	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3880	N/A	N/A	49.6715	0.9618	0.9843	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8423	N/A	N/A	49.6836	0.9618	0.9849	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4544	N/A	N/A	49.6924	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d

Emissions Report - Detail Format

Detail Calculations (AP-42)

R510/511 - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	129.3637	132.6208	136.0466	142.9539	148.9552	155.8714	165.8725	167.4663	160.9664	150.8849	137.8970	129.2861
Seal Factor A (lb-mole/ft-yr):	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528
Net Throughput (gal/mo.):	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000
Roof Fitting Losses (lb):	66.0133	67.6754	69.4236	72.9483	76.0107	79.5401	84.6435	85.4569	82.1400	76.9955	70.3678	65.9738
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	471.0298	475.9490	481.1230	491.5550	500.6187	511.0643	526.1688	528.5760	518.7592	503.5332	483.9176	470.9127

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	16.0949
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	9.0534
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34	1.30	0.08	0.65	222.3109
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	62.3678
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	281.6608
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	77	0.53	0.11	0.13	205.2603
Automatic Gauge Float Well/Bolted Cover, Gasketed	2	2.80	0.00	0.00	28.1661
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	70.4152

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

R510/511 - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	1,758.18	3,307.83	897.19	0.00	5,963.21
1,2,4-Trimethylbenzene	0.06	9.30	0.03	0.00	9.39
Benzene	1.51	4.68	0.77	0.00	6.96
Chrysene	0.00	0.07	0.00	0.00	0.07
Cresol (-m)	0.00	0.02	0.00	0.00	0.02
Cumene	0.00	0.08	0.00	0.00	0.08
Cyclohexene	7.43	24.48	3.79	0.00	35.69
Ethylbenzene	0.16	4.94	0.08	0.00	5.17
Hexane (-n)	15.49	29.55	7.91	0.00	52.95
Naphthalene	0.00	3.03	0.00	0.00	3.03
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	1.79	19.09	0.91	0.00	21.79
Unidentified Components	1,730.92	3,181.36	883.28	0.00	5,795.56
Xylenes (mixed isomers)	0.82	31.23	0.42	0.00	32.47

ATTACHMENT C

Tank R510 NSR Balance

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572-6321

November 13, 1980

Shell Oil Company
P. O. Box 6849
Carson, CA 90749

Attention: Environmental Conservation Manager

Dear Sir:

Transmitted herewith are the following permits authorizing you to operate the described equipment: 1622 EAST SEPULVEDA BLVD, CARSON

Permit No.	Application No.	Equipment Description
M-12199	C-18847	STORAGE TANK NO. R-513
M-12200	C-18848	STORAGE TANK NO. R-512
M-12251	C-18849	STORAGE TANK NO. R-511
M-12252	C-18850	STORAGE TANK NO. R-510

Rule 206 A person granted a permit under Rule 203 shall not operate or use any equipment unless the entire permit to operate or a legible facsimile of the entire permit is affixed upon the equipment in such a manner that the permit number equipment description and the specified operating conditions are clearly visible and accessible In the event that the equipment is so constructed that the permit to operate or the legible facsimile cannot be so placed the entire permit to operate or the legible facsimile of the entire permit shall be mounted so as to be clearly visible in an accessible place within 8 meters (26 feet) of the equipment or as otherwise approved by the Air Pollution Control Officer

These permits are being issued covering your application on file at the Air Quality Management District.

Very truly yours,

Eric E. Lemke
Chief Deputy Executive Officer

EEL:HT:la
Encs.

Helen Thompson, Permit Section

Rev. 8/78 30D170

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
METROPOLITAN ZONE

ENGINEERING DIVISION - APPLICATION EMISSION DATA SHEET

☑ P/C ☑ Basic Including Spray Booths ☐ Trade-offs ☑ Rule Reduction DATE: 7/10/78

☐ P/O ☐ Control Except Spray Booths ☐ Recall APPL. NO.: C-18850

NAME: SHELL OIL COMPANY

ADDRESS: 1622 EAST SEPULVEDA BLVD., CARSON 90749

☑ Rule 213 Applicable (unit installed or permit to construct issued on or subsequent to 10/8/76).

☐ Rule 213 Not Applicable (unit installed or permit to construct issued prior to 10/8/76, or previously exempt by Rule 219).

Emissions From This Permit Unit

(Complete for basic equipment and spray booths only)

Contaminant	THC	NO_x	SO_2	CO	Part.
Lbs/Hr	4.3	—	—	—	—
Lbs/Day	103.7	—	—	—	—

Altered Permit Unit ☑ Yes ☐ No Prior Permit Number or Date Installed Without Permit PRIOR APPLN NO'S: C-03789 (ARCO) P/C < 10/8/76 C-08256 (SHELL)

(Complete for basic equipment and spray booths only)

Emissions from previous permit unit:

Contaminant	THC	NO_x	SO_2	CO	Part.
Lbs/Hr	~~16.6~~	—	—	—	—
Lbs/Day	~~398.4~~	—	—	—	—

Mitigations (on premise reductions) Achieved Concurrent With This Application

(Also complete for control equipment except spray booths)

Appl. No	H/C Total		NO_x		SO_2		CO		Part.	
	#/Hr	#/Day	#/Hr	#/Day	#/Hr	#/Day	#/Hr	#/Day	#/Hr	#/Day

BACT Evaluation Not Made ☑ Made ☐ in Appl. _____ Date _____

Stationary Source (Entire Facility) Employs BACT Yes ☐ No ☐ UNKNOWN

Engineer _____

ATTACHMENT D

Rule 1401 Analysis

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TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	T2640
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	64	feet
Area (For Volume Source Only)	53100	ft^2
Distance-Residential	750	meters
Distance-Commercial	175	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
So[redacted]tput capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
B1	Benzene (including benzene from gasoline)	9.40E-03	78.11	0.0094		0.0094
P15	Chrysene	0.00E+00	228.2928	0		0
C30	Cresol mixtures	0.00E+00	108.14	0		0
E4	Ethyl benzene	1.20E-03	106.16	0.0012		0.0012
H8	Hexane (n-)	1.22E-01	86.18	0.1224		0.1224
P30	Naphthalene	5.00E-04	128.1732	0.0005		0.0005
P3	Phenol	0.00E+00	94.11	0		0
T3	Toluene (methyl benzene)	6.30E-03	92.13	0.0063		0.0063
X1	Xylenes (isomers and mixtures)	5.70E-03	106.2	0.0057		0.0057
[redacted]				0		
				0		
				0		

TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	T2640
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors table:

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.25	13.3
Commercial	2.6475	80.25

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

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Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	9.40E-03	9.40E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene			3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures				1	1	1	1.0000	600	
Ethyl benzene	1.20E-03	1.20E-03	8.70E-03	1	1	1	1	2000	
Hexane (n-)	1.22E-01	1.22E-01		1.0000	1.0000	1	1	7000	
Naphthalene	5.00E-04	5.00E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol				1	1	1	1	200	5800
Toluene (methyl benzene)	6.30E-03	6.30E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	5.70E-03	5.70E-03		1.0000	1.0000	1	1	700	22000

Attachment D

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	9.40E-03	9.40E-03	82.1184	0.0410592
Chrysene				
Cresol mixtures				
Ethyl benzene	1.20E-03	1.20E-03	10.4832	0.0052416
Hexane (n-)	1.22E-01	1.22E-01	1069.2864	0.5346432
Naphthalene	5.00E-04	5.00E-04	4.368	0.002184
Phenol				
Toluene (methyl benzene)	6.30E-03	6.30E-03	55.0368	0.0275184
Xylenes (isomers and mixtures)	5.70E-03	5.70E-03	49.7952	0.0248976
D4				
Total	1.46E-01	1.46E-01	1.27E+03	6.36E-01

Attachment D

A/N: T2640 Application deemed complete date: 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	2.95E-07	6.09E-07
Chrysene		
Cresol mixtures		
Ethyl benzene	3.27E-09	6.77E-09
Hexane (n-)		
Naphthalene	1.88E-08	3.89E-08
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**3.17E-07**	**6.55E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

Attachment D

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		6.87E-06	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV			Pass	Pass
Developmental - DEV	5.94E-04	2.04E-03	Pass	Pass
Endocrine system - END		6.87E-06	Pass	Pass
Eye	3.45E-05		Pass	Pass
Hematopoietic system - HEM	5.80E-04	1.79E-03	Pass	Pass
Immune system - IMM	5.80E-04		Pass	Pass
Kidney - KID		6.87E-06	Pass	Pass
Nervous system - NS	1.37E-05	2.33E-03	Pass	Pass
Reproductive system - REP	5.94E-04		Pass	Pass
Respiratory system - RES	3.45E-05	9.70E-04	Pass	Pass
Skin			Pass	Pass

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Attachment D

A/N: T2640 Application deemed complete date: 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			9.62E-05		9.62E-05	9.62E-05		9.62E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol										
Toluene (methyl benzene)			2.26E-06	2.26E-06			2.26E-06	2.26E-06	2.26E-06	
Xylenes (isomers and mixtures)				3.45E-06					3.45E-06	
Total			9.84E-05	5.71E-06	9.62E-05	9.62E-05	2.26E-06	9.84E-05	5.71E-06	

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Attachment D

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			5.80E-04		5.80E-04	5.80E-04		5.80E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol										
Toluene (methyl benzene)			1.37E-05	1.37E-05			1.37E-05	1.37E-05	1.37E-05	
Xylenes (isomers and mixtures)				2.08E-05					2.08E-05	
Total			5.94E-04	3.45E-05	5.80E-04	5.80E-04	1.37E-05	5.94E-04	3.45E-05	

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Attachment D

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.69E-04			1.69E-04			1.69E-04			
Chrysene													
Cresol mixtures													
Ethyl benzene	6.49E-07			6.49E-07	6.49E-07				6.49E-07				
Hexane (n-)										1.89E-05			
Naphthalene												6.01E-05	
Phenol													
Toluene (methyl benzene)				2.27E-05						2.27E-05		2.27E-05	
Xylenes (isomers and mixtures)										8.80E-06		8.80E-06	
Total	6.49E-07			1.93E-04	6.49E-07		1.69E-04		6.49E-07	2.20E-04		9.16E-05	

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Attachment D

A/N: T2640 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.79E-03			1.79E-03			1.79E-03			
Chrysene													
Cresol mixtures													
Ethyl benzene	6.87E-06			6.87E-06	6.87E-06				6.87E-06				
Hexane (n-)										2.00E-04			
Naphthalene												6.36E-04	
Phenol													
Toluene (methyl benzene)				2.40E-04						2.40E-04		2.40E-04	
Xylenes (isomers and mixtures)										9.32E-05		9.32E-05	
Total	6.87E-06			2.04E-03	6.87E-06		1.79E-03		6.87E-06	2.33E-03		9.70E-04	

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Attachment D

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	T2643
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	48	feet
Area (For Volume Source Only)	3000	ft^2
Distance-Residential	700	meters
Distance-Commercial	125	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (NO = Tier 1 or Tier 2; YES = Tier 3)	NO	

Emission Units	lb/hr	
Source output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0 1	lbs/hr
B1	Benzene (including benzene from gasoline)	2.40E-03	78.11	0.0024		0.0024
P15	Chrysene	0.00E+00	228.2928	0		0
C30	Cresol mixtures	0.00E+00	108.14	0		0
E4	Ethyl benzene	2.00E-04	106.16	0.0002		0.0002
H8	Hexane (n-)	3.15E-02	86.18	0.0315		0.0315
P30	Naphthalene	1.00E-04	128.1732	0.0001		0.0001
P3	Phenol	0.00E+00	94.11	0		0
T3	Toluene (methyl benzene)	1.30E-03	92.13	0.0013		0.0013
X1	Xylenes (isomers and mixtures)	9.00E-04	106.2	0.0009		0.0009
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TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	T2643
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors tables

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.282	16.48
Commercial	4.8075	180

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

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Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	2.40E-03	2.40E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene			3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures				1	1	1	1.0000	600	
Ethyl benzene	2.00E-04	2.00E-04	8.70E-03	1	1	1	1	2000	
Hexane (n-)	3.15E-02	3.15E-02		1.0000	1.0000	1	1	7000	
Naphthalene	1.00E-04	1.00E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol				1	1	1	1	200	5800
Toluene (methyl benzene)	1.30E-03	1.30E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	9.00E-04	9.00E-04		1.0000	1.0000	1	1	700	22000

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	2.40E-03	2.40E-03	20.9664	0.0104832
Chrysene				
Cresol mixtures				
Ethyl benzene	2.00E-04	2.00E-04	1.7472	0.0008736
Hexane (n-)	3.15E-02	3.15E-02	275.184	0.137592
Naphthalene	1.00E-04	1.00E-04	0.8736	0.0004368
Phenol				
Toluene (methyl benzene)	1.30E-03	1.30E-03	11.3568	0.0056784
Xylenes (isomers and mixtures)	9.00E-04	9.00E-04	7.8624	0.0039312
Total	3.64E-02	3.64E-02	3.18E+02	1.59E-01

A/N: T2643 Application deemed complete date: 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	8.49E-08	2.82E-07
Chrysene		
Cresol mixtures		
Ethyl benzene	6.15E-10	2.05E-09
Hexane (n-)		
Naphthalene	4.24E-09	1.41E-08
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**8.97E-08**	**2.99E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		2.08E-06	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV			Pass	Pass
Developmental - DEV	3.39E-04	9.24E-04	Pass	Pass
Endocrine system - END		2.08E-06	Pass	Pass
Eye	1.37E-05		Pass	Pass
Hematopoietic system - HEM	3.32E-04	8.32E-04	Pass	Pass
Immune system - IMM	3.32E-04		Pass	Pass
Kidney - KID		2.08E-06	Pass	Pass
Nervous system - NS	6.32E-06	1.04E-03	Pass	Pass
Reproductive system - REP	3.39E-04		Pass	Pass
Respiratory system - RES	1.37E-05	3.48E-04	Pass	Pass
Skin			Pass	Pass

A/N: T2643 Application deemed complete date: 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			3.04E-05		3.04E-05	3.04E-05		3.04E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol										
Toluene (methyl benzene)			5.79E-07	5.79E-07			5.79E-07	5.79E-07	5.79E-07	
Xylenes (isomers and mixtures)				6.74E-07					6.74E-07	
Total			3.10E-05	1.25E-06	3.04E-05	3.04E-05	5.79E-07	3.10E-05	1.25E-06	

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			3.32E-04		3.32E-04	3.32E-04		3.32E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol										
Toluene (methyl benzene)			6.32E-06	6.32E-06			6.32E-06	6.32E-06	6.32E-06	
Xylenes (isomers and mixtures)				7.36E-06					7.36E-06	
Total			3.39E-04	1.37E-05	3.32E-04	3.32E-04	6.32E-06	3.39E-04	1.37E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				4.88E-05			4.88E-05			4.88E-05			
Chrysene													
Cresol mixtures													
Ethyl benzene	1.22E-07			1.22E-07	1.22E-07				1.22E-07				
Hexane (n-)										5.49E-06			
Naphthalene												1.35E-05	
Phenol													
Toluene (methyl benzene)				5.28E-06						5.28E-06		5.28E-06	
Xylenes (isomers and mixtures)										1.57E-06		1.57E-06	
Total	1.22E-07			5.42E-05	1.22E-07		4.88E-05		1.22E-07	6.11E-05		2.04E-05	

A/N: T2643 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				8.32E-04			8.32E-04			8.32E-04			
Chrysene													
Cresol mixtures													
Ethyl benzene	2.08E-06			2.08E-06	2.08E-06				2.08E-06				
Hexane (n-)										9.36E-05			
Naphthalene												2.31E-04	
Phenol													
Toluene (methyl benzene)				9.01E-05						9.01E-05		9.01E-05	
Xylenes (isomers and mixtures)										2.67E-05		2.67E-05	
Total	2.08E-06			9.24E-04	2.08E-06		8.32E-04		2.08E-06	1.04E-03		3.48E-04	

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TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	R510
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	50	feet
Area (For Volume Source Only)	47742.25	ft^2
Distance-Residential	650	meters
Distance-Commercial	50	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
Source output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0 1	lbs/hr
B1	Benzene (including benzene from gasoline)	7.95E-04	78.11	0.0007945		0.0007945
P15	Chrysene	7.99E-06	228.2928	7.99087E-06		7.99087E-06
C30	Cresol mixtures	2.28E-06	108.14	2.28311E-06		2.28311E-06
E4	Ethyl benzene	5.90E-04	106.16	0.000590183		0.000590183
H8	Hexane (n-)	6.04E-03	86.18	0.006044521		0.006044521
P30	Naphthalene	3.46E-04	128.1732	0.00034589		0.00034589
P3	Phenol	1.14E-06	94.11	1.14155E-06		1.14155E-06
T3	Toluene (methyl benzene)	2.49E-03	92.13	0.002487443		0.002487443
X1	Xylenes (isomers and mixtures)	3.71E-03	106.2	0.003706621		0.003706621
				0		
				0		
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TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	R510
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors tables

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.302	15.7
Commercial	13.05	213.8

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0 96
Worker	1	149	0.38

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Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	7.95E-04	7.95E-04	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	7.99E-06	7.99E-06	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	2.28E-06	2.28E-06		1	1	1	1.0000	600	
Ethyl benzene	5.90E-04	5.90E-04	8.70E-03	1	1	1	1	2000	
Hexane (n-)	6.04E-03	6.04E-03		1.0000	1.0000	1	1	7000	
Naphthalene	3.46E-04	3.46E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	1.14E-06	1.14E-06		1	1	1	1	200	5800
Toluene (methyl benzene)	2.49E-03	2.49E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	3.71E-03	3.71E-03		1.0000	1.0000	1	1	700	22000

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Attachment D

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	7.95E-04	7.95E-04	6.940752	0.003470376
Chrysene	7.99E-06	7.99E-06	0.06980822	3.49041E-05
Cresol mixtures	2.28E-06	2.28E-06	0.01994521	9.9726E-06
Ethyl benzene	5.90E-04	5.90E-04	5.15583562	0.002577918
Hexane (n-)	6.04E-03	6.04E-03	52.8049315	0.026402466
Naphthalene	3.46E-04	3.46E-04	3.02169863	0.001510849
Phenol	1.14E-06	1.14E-06	0.0099726	4.9863E-06
Toluene (methyl benzene)	2.49E-03	2.49E-03	21.7303014	0.010865151
Xylenes (isomers and mixtures)	3.71E-03	3.71E-03	32.3810411	0.016190521
Total	1.40E-02	1.40E-02	1.22E+02	6.11E-02

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Attachment D

A/N: R510 Application deemed complete date: 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	3.01E-08	2.54E-07
Chrysene	3.51E-09	1.46E-08
Cresol mixtures		
Ethyl benzene	1.94E-09	1.64E-08
Hexane (n-)		
Naphthalene	1.57E-08	1.33E-07
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**5.13E-08**	**4.17E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

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Attachment D

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		1.70E-05	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		3.22E-07	Pass	Pass
Developmental - DEV	1.45E-04	1.23E-03	Pass	Pass
Endocrine system - END		1.67E-05	Pass	Pass
Eye	5.04E-05		Pass	Pass
Hematopoietic system - HEM	1.31E-04	7.47E-04	Pass	Pass
Immune system - IMM	1.31E-04		Pass	Pass
Kidney - KID		1.70E-05	Pass	Pass
Nervous system - NS	1.44E-05	1.56E-03	Pass	Pass
Reproductive system - REP	1.45E-04		Pass	Pass
Respiratory system - RES	5.04E-05	2.94E-03	Pass	Pass
Skin			Pass	Pass

A/N: R510 **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			9.60E-06		9.60E-06	9.60E-06		9.60E-06		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				3.09E-09					3.09E-09	
Toluene (methyl benzene)			1.06E-06	1.06E-06			1.06E-06	1.06E-06	1.06E-06	
Xylenes (isomers and mixtures)				2.65E-06					2.65E-06	
Total			1.07E-05	3.70E-06	9.60E-06	9.60E-06	1.06E-06	1.07E-05	3.70E-06	

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			1.31E-04		1.31E-04	1.31E-04		1.31E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				4.21E-08					4.21E-08	
Toluene (methyl benzene)			1.44E-05	1.44E-05			1.44E-05	1.44E-05	1.44E-05	
Xylenes (isomers and mixtures)				3.60E-05					3.60E-05	
Total			1.45E-04	5.04E-05	1.31E-04	1.31E-04	1.44E-05	1.45E-04	5.04E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.73E-05			1.73E-05			1.73E-05			
Chrysene													
Cresol mixtures										4.97E-09			
Ethyl benzene	3.85E-07			3.85E-07	3.85E-07				3.85E-07				
Hexane (n-)										1.13E-06			
Naphthalene												5.02E-05	
Phenol	7.45E-09		7.45E-09						7.45E-09	7.45E-09			
Toluene (methyl benzene)				1.08E-05						1.08E-05		1.08E-05	
Xylenes (isomers and mixtures)										6.92E-06		6.92E-06	
Total	3.93E-07		7.45E-09	2.85E-05	3.85E-07		1.73E-05		3.93E-07	3.62E-05		6.79E-05	

A/N: R510 **Application deemed complete date:** 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				7.47E-04			7.47E-04			7.47E-04			
Chrysene													
Cresol mixtures										2.15E-07			
Ethyl benzene	1.67E-05			1.67E-05	1.67E-05				1.67E-05				
Hexane (n-)										4.87E-05			
Naphthalene												2.17E-03	
Phenol	3.22E-07		3.22E-07						3.22E-07	3.22E-07			
Toluene (methyl benzene)				4.68E-04						4.68E-04		4.68E-04	
Xylenes (isomers and mixtures)										2.99E-04		2.99E-04	
Total	1.70E-05		3.22E-07	1.23E-03	1.67E-05		7.47E-04		1.70E-05	1.56E-03		2.94E-03	

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	R511
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	50	feet
Area (For Volume Source Only)	47742.25	ft^2
Distance-Residential	550	meters
Distance-Commercial	50	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
Sc[redacted]utput capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
B1	Benzene (including benzene from gasoline)	7.95E-04	78.11	0.0007945		0.0007945
P15	Chrysene	7.99E-06	228.2928	7.99087E-06		7.99087E-06
C30	Cresol mixtures	2.28E-06	108.14	2.28311E-06		2.28311E-06
E4	Ethyl benzene	5.90E-04	106.16	0.000590183		0.000590183
H8	Hexane (n-)	6.04E-03	86.18	0.006044521		0.006044521
P30	Naphthalene	3.46E-04	128.1732	0.00034589		0.00034589
P3	Phenol	1.14E-06	94.11	1.14155E-06		1.14155E-06
T3	Toluene (methyl benzene)	2.49E-03	92.13	0.002487443		0.002487443
X1	Xylenes (isomers and mixtures)	3.71E-03	106.2	0.003706621		0.003706621
				0		
[redacted]				0		
				0		
				0		

TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N: R511
Fac: 171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors tables

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.354	18.1
Commercial	13.05	213.8

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

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Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	7.95E-04	7.95E-04	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	7.99E-06	7.99E-06	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	2.28E-06	2.28E-06		1	1	1	1.0000	600	
Ethyl benzene	5.90E-04	5.90E-04	8.70E-03	1	1	1	1	2000	
Hexane (n-)	6.04E-03	6.04E-03		1.0000	1.0000	1	1	7000	
Naphthalene	3.46E-04	3.46E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	1.14E-06	1.14E-06		1	1	1	1	200	5800
Toluene (methyl benzene)	2.49E-03	2.49E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	3.71E-03	3.71E-03		1.0000	1.0000	1	1	700	22000

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	7.95E-04	7.95E-04	6.940752	0.003470376
Chrysene	7.99E-06	7.99E-06	0.06980822	3.49041E-05
Cresol mixtures	2.28E-06	2.28E-06	0.01994521	9.9726E-06
Ethyl benzene	5.90E-04	5.90E-04	5.15583562	0.002577918
Hexane (n-)	6.04E-03	6.04E-03	52.8049315	0.026402466
Naphthalene	3.46E-04	3.46E-04	3.02169863	0.001510849
Phenol	1.14E-06	1.14E-06	0.0099726	4.9863E-06
Toluene (methyl benzene)	2.49E-03	2.49E-03	21.7303014	0.010865151
Xylenes (isomers and mixtures)	3.71E-03	3.71E-03	32.3810411	0.016190521
Total	1.40E-02	1.40E-02	1.22E+02	6.11E-02

A/N: R511 Application deemed complete date: 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	3.53E-08	2.54E-07
Chrysene	4.12E-09	1.46E-08
Cresol mixtures		
Ethyl benzene	2.28E-09	1.64E-08
Hexane (n-)		
Naphthalene	1.84E-08	1.33E-07
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**6.01E-08**	**4.17E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

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Attachment D

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		1.70E-05	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		3.22E-07	Pass	Pass
Developmental - DEV	1.45E-04	1.23E-03	Pass	Pass
Endocrine system - END		1.67E-05	Pass	Pass
Eye	5.04E-05		Pass	Pass
Hematopoietic system - HEM	1.31E-04	7.47E-04	Pass	Pass
Immune system - IMM	1.31E-04		Pass	Pass
Kidney - KID		1.70E-05	Pass	Pass
Nervous system - NS	1.44E-05	1.56E-03	Pass	Pass
Reproductive system - REP	1.45E-04		Pass	Pass
Respiratory system - RES	5.04E-05	2.94E-03	Pass	Pass
Skin			Pass	Pass

A/N: R511 **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			1.11E-05		1.11E-05	1.11E-05		1.11E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				3.56E-09					3.56E-09	
Toluene (methyl benzene)			1.22E-06	1.22E-06			1.22E-06	1.22E-06	1.22E-06	
Xylenes (isomers and mixtures)				3.05E-06					3.05E-06	
Total			1.23E-05	4.27E-06	1.11E-05	1.11E-05	1.22E-06	1.23E-05	4.27E-06	

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			1.31E-04		1.31E-04	1.31E-04		1.31E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				4.21E-08					4.21E-08	
Toluene (methyl benzene)			1.44E-05	1.44E-05			1.44E-05	1.44E-05	1.44E-05	
Xylenes (isomers and mixtures)				3.60E-05					3.60E-05	
Total			1.45E-04	5.04E-05	1.31E-04	1.31E-04	1.44E-05	1.45E-04	5.04E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				2.03E-05			2.03E-05			2.03E-05			
Chrysene													
Cresol mixtures										5.82E-09			
Ethyl benzene	4.52E-07			4.52E-07	4.52E-07				4.52E-07				
Hexane (n-)										1.32E-06			
Naphthalene												5.88E-05	
Phenol	8.74E-09		8.74E-09						8.74E-09	8.74E-09			
Toluene (methyl benzene)				1.27E-05						1.27E-05		1.27E-05	
Xylenes (isomers and mixtures)										8.11E-06		8.11E-06	
Total	4.60E-07		8.74E-09	3.34E-05	4.52E-07		2.03E-05		4.60E-07	4.24E-05		7.96E-05	

A/N: R511 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				7.47E-04			7.47E-04			7.47E-04			
Chrysene													
Cresol mixtures										2.15E-07			
Ethyl benzene	1.67E-05			1.67E-05	1.67E-05				1.67E-05				
Hexane (n-)										4.87E-05			
Naphthalene												2.17E-03	
Phenol	3.22E-07		3.22E-07						3.22E-07	3.22E-07			
Toluene (methyl benzene)				4.68E-04						4.68E-04		4.68E-04	
Xylenes (isomers and mixtures)										2.99E-04		2.99E-04	
Total	1.70E-05		3.22E-07	1.23E-03	1.67E-05		7.47E-04		1.70E-05	1.56E-03		2.94E-03	

D-40

Attachment D

Janice West

From: Jeffrey Inabinet
Sent: Friday, March 29, 2013 8:44 AM
To: Janice West
Subject: RE: CEQA for Phillips 66 Carson new crude tanks

Hi Janice-

Thanks for checking in with me on this project. I have the revised document (they submitted an earlier version that indicated they were installing two tanks- now only installing one), but haven't had a chance to look at it yet. I am out of the office next week, but plan on reviewing it the following week. I just had a meeting with their consultant yesterday, so I believe they are now aware of my schedule. I'll let you know when I complete my review and we can discuss any outstanding issues.

Thanks-

Jeff

Jeff Inabinet
Air Quality Specialist
Planning, Rule Development & Area Sources
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4182
jinabinet@aqmd.gov
909.396.2453 phone
909.396.3324 fax

From: Janice West
Sent: Thursday, March 28, 2013 10:35 AM
To: Jeffrey Inabinet
Subject: CEQA for Phillips 66 Carson new crude tanks

Hi Jeff,

Any update on a rough timeframe for the CEQA analysis for the Phillips 66-Carson new crude tanks? I'm trying to figure out how much overtime I'll need so I can finish my evaluation before you finish the CEQA analysis. (we're restricted to backlog-only during regular hours). Plus, the facility is asking (politely).

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
west@aqmd.gov

Janice West

From: Janice West
Sent: Thursday, March 28, 2013 10:37 AM
To: 'Matthews, John W'
Subject: RE: Carson Crude Tank Storage Capacity Permit Application Status Update Request

Hi John,

I've requested approval to work on your applications this weekend. I'll probably get back to you early next week with a better answer (I haven't yet had a chance to review your AI). I'm also checking with CEQA, but I haven't heard back from them yet.

Janice

From: Matthews, John W [mailto:John.Matthews@p66.com]
Sent: Wednesday, March 27, 2013 12:12 PM
To: Janice West
Subject: Carson Crude Tank Storage Capacity Permit Application Status Update Request

Janice,

Have you had a chance to review the answers to your additional information request and the revised materials that were submitted earlier this month?

Are there any items for which you still need additional information?

Assuming the negative declaration moves forward, is it safe to assume that the CEQA process will be the "rate determining step" with respect to permit issuance?

John W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

ENVIRONMENTAL AUDIT, INC. ®

1000-A Ortega Way, Placentia, CA 92870-7162
714/632-8521 FAX: 714/632-6754

34th ANNIVERSARY
email:dstevens@envaudit.com
mbaverman@envaudit.com

MEMORANDUM

Hand Delivered

Project No. 2778

DATE: March 12, 2013

TO: Janice West
SCAQMD

FROM: Marcia Baverman MRB

RE: Revised Application Package for Tanks 2640, 2643, 510, and 511

With the removal of Tank 2641 from the proposed project, EAI has recalculated the throughputs for Tanks 2640, 510, 511, and 2643. As such, the attached SCAQMD Form E-18s have been updated to reflect the current throughput information. The Form E-GI has been revised as well and is also attached. Please contact John Matthews at Phillips 66 at 310-952-6213 or me at 714-632-8521 ext. 237, if you need further clarification.

Thanks.

MRB:pe

cc: John Matthews, Phillips 66

m:\mc\2778\2778 Janice West Cover Memo #1.doc

South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): Phillips 66 Los Angeles Refinery, Carson Plant

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 171109

Address where the equipment will be operated (for equipment which will be moved to various locations in AQMD's jurisdiction, please list the initial location site): 1520 East Sepulveda Boulevard, Carson, CA 90745

(•) Fixed Location ( ) Various Locations

Tank Type (Select ONE)

( ) External Floating Roof Tank (EFRT) ( ) Internal Floating Roof Tank (IFRT) ( ) Horizontal Tank (HT)
( ) Vertical Fixed Roof Tank (VFRT) (•) Domed External Roof Tank (DEFRT)

Identification

Tank Identification Number: 2640

Tank Contents/Product (include MSDS): Crude Oil with 11 RVP

Section B - Tank Information

Tank Characteristics

Shell Diameter (ft.): 260

Shell Length (ft.):

Shell Height (ft.): 64

Turnovers Per Year: 60

Is Tank Heated? ( ) Yes (•) No

Is Tank Underground? ( ) Yes (•) No

Net Throughput (gal/year): 1260MM

Self Support Roof: (•) Yes ( ) No

Number of Columns? 0

Effective Column Diameter: ( ) 9" by 7" Built Up Column - 1.1 ( ) 8" Diameter Pipe - 0.7 ( ) Unknown - 1

External Shell Condition: (•) Good ( ) Poor

Internal Shell Color: (•) Light Rust ( ) Dense Rust ( ) Gunite Lining

External Shell Color: (•) White/White ( ) Aluminum/Specular ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Gray/Medium ( ) Red/Primer

Average Liquid Height (ft.) (Vertical Only): 30

Maximum Liquid Height (ft.) (Vertical Only): 60

Working Volume (gal.) (Vertical Only): 21000000

Actual Volume (gal.) (Vertical Only): 24150000

Paint Condition: (•) Good ( ) Poor

Paint Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Roof Characteristics (Floating Roof Tank)

Roof Type: ( ) Pontoon ( ) Double Deck (•) Dome Roof (Height 55.5 ft.) ( ) Cone Roof (Height ____ ft.)

Roof Fitting Category: ( ) Typical (•) Detail

Roof Height (ft.):

Roof Paint Condition: (•) Good ( ) Poor

Roof Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Deck Characteristics (Floating Roof Tank)

Deck Type: (•) Welded ( ) Bolted

Deck Fitting Characteristics: ( ) Typical ( ) Detailed (Complete Deck Seam)

Construction:	Deck Seam Length (ft.):	Deck Seam:
( ) Sheet		( ) 5 ft. wide ( ) 6 ft. wide ( ) 7 ft. wide
( ) Panel		( ) 5 x 7.5 ft. ( ) 5 x 12 ft.

Tank Construction and Rim -Seal System (Floating Roof Tank)

Tank Construction: (•) Welded ( ) Riveted

Primary Seal: (•) Mechanical Shoe ( ) Liquid Mounted ( ) Vapor Mounted

Secondary Seal: (•) Rim Mounted ( ) None ( ) Shoe Mounted

Breather Vent Setting

Vacuum Setting (psig):

Pressure Setting (psig):

* Section D of the application MUST be completed.

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South Coast Air Quality Management District

Form 400-E-18
Storage Tank

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Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section B - Tank Information (cont.)

Site Selection

Nearest Major City: Long Beach

Daily Average Ambient Temperature (°F): 64.31 Annual Average Minimum Temperature (°F): 54.40

Annual Average Maximum Temperature (°F): 74.22 Average Wind Speed (mph): 6.36

Annual Average Solar Insulation Factor (Btu / (ft^3 * ft * day)): 1571.65

Tank Contents

Chemical Category: ○ Organic Liquids ◉ Crude Oil ○ Petroleum Distillates

Liquid: ○ Single ◉ Multiple

If Multiple, Select Speciation Option: ○ Full Speciation ◉ Partial Speciation ○ Various Weight Speciation ○ None

Section C - Operation Information

Vapor Control

Vapor Control During Loading or Unloading: ☐ Sparger ☐ Vapor Balance System ☐ Vapor Return Line ☐ Vented to Air Pollution Control Equipment [1]

[1] A separate permit is required. If APC equipment is already permitted, provide Permit or Device Number: _____

Vent Valve Data

Indicate Type of Setting and Vapor Disposal

	Number	Pressure Setting	Vaccum Setting	Discharging to (Check Appropriate Box)		
				Atmosphere	Vapor Control	Flare
Combination				☐	☐	☐
Pressure				☐	☐	☐
Vaccum				☐	☐	☐
Open				☐	☐	☐

Materials

Name all liquids, vapors, gases, or mixtures of such material to be stored in this tank:

Crude Oil

If material is stored in a solution, supply the following information:

Name of Solvent: _____ Name of Materials Dissolved: _____

Concentration of Materials Dissolved: _____ % by Weight OR _____ % by Volume OR _____ lbs/gal

Section D - Roof/Deck Fitting

Section D is required for the following tanks: External Floating Roof Tank, Internal Floating Roof Tanks, or Domed External Floating Roof Tanks.

Select the number of fittings for each applicable question. Examples: 3 Unbolted Cover, Ungasketed; _____ Unbolted Cover, Gasketed

Roof/Deck Fitting Details

1. Access Hatch (24" diameter well)
   - 6 Bolted Cover, Gasketed
   - _____ Unbolted Cover, UnGasketed
   - _____ Unbolted Cover, Gasketed

2. Automatic Gauge Float Well (20" diameter well)
   - 3 Bolted Cover, Gasketed
   - _____ Unbolted Cover, Ungasketed
   - _____ Unbolted Cover, Gasketed

3. Column Well (24" diameter well)
   - _____ Built-Up Col - Sliding Cover, Gasketed
   - _____ Built-Up Col - Sliding Cover, Ungasketed
   - _____ Pipe Col - Flex, Fabric Sleeve Seal
   - _____ Pipe Col - Sliding Cover, Gasketed
   - _____ Pipe Col - Sliding Cover, Ungasketed

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Section D - Roof/Deck Fitting (cont.)

Roof/Deck Fitting Details (cont.)

4. Gauge Hatch/Sample Well (8" diameter well)
- 1 Weighted Mechanical Actuation, Gasketed
- _____ Weighted Mechanical Actuation, Ungasketed

5. Ladder Well (36" diameter)
- _____ Sliding Cover, Gasketed
- _____ Sliding Cover, Ungasketed

6. Rim Vent (6" diameter)
- _____ Weighted Mechanical Actuation, Gasketed
- _____ Weighted Mechanical Actuation, Ungasketed

7. Roof Drain (3" diameter)
- _____ Open
- _____ 90% Close

8. Roof Leg (3" diameter leg)
- _____ Adjustable, Pontoon Area, Ungasketed
- _____ Adjustable, Center Area, Ungasketed
- 260 Adjustable, Double-Deck Roofs
- _____ Fixed
- _____ Adjustable, Pontoon Area, Gasketed
- _____ Adjustable, Pontoon Area, Sock
- _____ Adjustable, Center Area, Gasketed
- _____ Adjustable, Center Area, Sock

9. Roof Leg or Hang Well
- _____ Adjustable
- _____ Fixed

10. Sample Pipe (24" diameter)
- _____ Slotted Pipe – Sliding Cover, Gasketed
- _____ Slotted Pipe – Sliding Cover, Ungasketed
- _____ Slit Fabric Seal, 10% Open

11. Guided Pole/Sample Well
- _____ Ungasketed, Sliding Cover, Without Float
- _____ Ungasketed Sliding Cover, With Float
- _____ Gasketed Sliding Cover, Without Float
- _____ Gasketed Sliding Cover, With Float
- _____ Gasketed Sliding Cover, With Pole Sleeve
- _____ Gasketed Sliding Cover, With Pole Wiper
- _____ Gasketed Sliding Cover, With Float, Wiper
- _____ Gasketed Sliding Cover, With Float, Sleeve, Wiper
- _____ Gasketed Sliding Cover, With Pole Sleeve, Wiper

12. _____ **Stub Drain** (1" diameter)

13. Unslotted Guide – Pole Well
- _____ Ungasketed, Sliding Cover
- _____ Gasketed Sliding Cover
- _____ Ungasketed Sliding Cover with Sleeve
- _____ Gasketed Sliding Cover with Sleeve
- 1 Gasketed Sliding Cover with Wiper

14. Vacuum Breaker (10" diameter well)
- 6 Weighted Mechanical Actuation, Gasketed
- _____ Weighted Mechanical Actuation, Ungasketed

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: Marcia Baver Date: 3/12/13

Title: Project Manager Company Name: Environmental Audit Inc.

Name: Marcia Baverman

Phone #: (714) 632-8521 Fax #: (714) 632-6754

Email: mbaverman@envaudit.com

Contact Info

Name: John Matthews

Title: Env. Engineer Company Name: Philips 66

Phone #: (310) 952-6213 Fax #:

Email: John.Matthews@p66.com

THIS IS A PUBLIC DOCUMENT

Pursuant to the California Public Records Act, your permit application and any supplemental documentation are public records and may be disclosed to a third party. If you wish to claim certain limited information as exempt from disclosure because it qualifies as a trade secret, as defined in the District's Guidelines for Implementing the California Public Records Act, you must make such claim at the time of submittal to the District.

Check here if you claim that this form or its attachments contain confidential trade secret information. ☒

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South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): Phillips 66 Los Angeles Refinery, Carson Plant

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 171109

Address where the equipment will be operated (for equipment which will be moved to various locations in AQMD's jurisdiction, please list the initial location site): 1520 East Sepulveda Boulevard, Carson, CA 90745

(•) Fixed Location ( ) Various Locations

Tank Type (Select ONE)

( ) External Floating Roof Tank (EFRT) ( ) Internal Floating Roof Tank (IFRT) ( ) Horizontal Tank (HT)
( ) Vertical Fixed Roof Tank (VFRT) (•) Domed External Roof Tank (DEFRT)

Identification

Tank Identification Number: 2643

Tank Contents/Product (include MSDS): Salt water draw from crude oil (RVP 11) storage tanks

Section B - Tank Information

Tank Characteristics

Shell Diameter (ft.): 40
Shell Length (ft.):
Shell Height (ft.): 48
Turnovers Per Year: 77

Is Tank Heated? ( ) Yes (•) No
Is Tank Underground? ( ) Yes (•) No
Net Throughput (gal/year): 32.256MM
Self Support Roof: (•) Yes ( ) No

Number of Columns? 0
Effective Column Diameter: ( ) 9" by 7" Built Up Column - 1.1 ( ) 8" Diameter Pipe - 0.7 ( ) Unknown - 1

External Shell Condition: (•) Good ( ) Poor
Internal Shell Color: (•) Light Rust ( ) Dense Rust ( ) Gunite Lining
External Shell Color: (•) White/White ( ) Aluminum/Specular ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Gray/Medium ( ) Red/Primer

Average Liquid Height (ft.) (Vertical Only): 23
Maximum Liquid Height (ft.) (Vertical Only): 46
Working Volume (gal.) (Vertical Only): 420000
Actual Volume (gal.) (Vertical Only): 483000

Paint Condition: (•) Good ( ) Poor
Paint Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Roof Characteristics (Floating Roof Tank)

Roof Type: ( ) Pontoon ( ) Double Deck (•) Dome Roof (Height 8.5 ft.) ( ) Cone Roof (Height ____ ft.)
Roof Fitting Category: ( ) Typical (•) Detail
Roof Height (ft.):

Roof Paint Condition: (•) Good ( ) Poor
Roof Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Deck Characteristics (Floating Roof Tank)

Deck Type: (•) Welded ( ) Bolted
Deck Fitting Characteristics: ( ) Typical ( ) Detailed (Complete Deck Seam)

Construction:	Deck Seam Length (ft.):	Deck Seam:
( ) Sheet		( ) 5 ft. wide ( ) 6 ft. wide ( ) 7 ft. wide
( ) Panel		( ) 5 x 7.5 ft. ( ) 5 x 12 ft.

Tank Construction and Rim -Seal System (Floating Roof Tank)

Tank Construction: (•) Welded ( ) Riveted
Primary Seal: (•) Mechanical Shoe ( ) Liquid Mounted ( ) Vapor Mounted
Secondary Seal: (•) Rim Mounted ( ) None ( ) Shoe Mounted

Breather Vent Setting

Vacuum Setting (psig):
Pressure Setting (psig):

* Section D of the application MUST be completed.

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South Coast Air Quality Management District

Form 400-E-18
Storage Tank

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Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section B - Tank Information (cont.)

Site Selection

Nearest Major City: Long Beach

Daily Average Ambient Temperature (°F): 64.31 Annual Average Minimum Temperature (°F): 54.40

Annual Average Maximum Temperature (°F): 74.22 Average Wind Speed (mph): 6.36

Annual Average Solar Insulation Factor (Btu / (ft^3 * ft * day)): 1571.65

Tank Contents

Chemical Category: ○ Organic Liquids ◉ Crude Oil ○ Petroleum Distillates

Liquid: ○ Single ◉ Multiple

If Multiple, Select Speciation Option: ○ Full Speciation ◉ Partial Speciation ○ Various Weight Speciation ○ None

Section C - Operation Information

Vapor Control

Vapor Control During Loading or Unloading: ☐ Sparger ☐ Vapor Balance System ☐ Vapor Return Line ☐ Vented to Air Pollution Control Equipment [1]

[1] A separate permit is required. If APC equipment is already permitted, provide Permit or Device Number: _____

Vent Valve Data

Indicate Type of Setting and Vapor Disposal

	Number	Pressure Setting	Vaccum Setting	Discharging to (Check Appropriate Box)		
				Atmosphere	Vapor Control	Flare
Combination				☐	☐	☐
Pressure				☐	☐	☐
Vaccum				☐	☐	☐
Open				☐	☐	☐

Materials

Name all liquids, vapors, gases, or mixtures of such material to be stored in this tank:
Salt water with crude oil

If material is stored in a solution, supply the following information:

Name of Solvent: _____ Name of Materials Dissolved: _____

Concentration of Materials Dissolved: _____ % by Weight OR _____ % by Volume OR _____ lbs/gal

Section D - Roof/Deck Fitting

Section D is required for the following tanks: External Floating Roof Tank, Internal Floating Roof Tanks, or Domed External Floating Roof Tanks.

Select the number of fittings for each applicable question. Examples: 3 Unbolted Cover, Ungasketed; _____ Unbolted Cover, Gasketed

Roof/Deck Fitting Details

1. Access Hatch (24" diameter well)	2. Automatic Gauge Float Well (20" diameter well)	3. Column Well (24" diameter well)
2 Bolted Cover, Gasketed	1 Bolted Cover, Gasketed	_____ Built-Up Col - Sliding Cover, Gasketed
_____ Unbolted Cover, UnGasketed	_____ Unbolted Cover, Ungasketed	_____ Built-Up Col - Sliding Cover, Ungasketed
_____ Unbolted Cover, Gasketed	_____ Unbolted Cover, Gasketed	_____ Pipe Col - Flex, Fabric Sleeve Seal
		_____ Pipe Col - Sliding Cover, Gasketed
		_____ Pipe Col - Sliding Cover, Ungasketed

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Section D - Roof/Deck Fitting (cont.)

Roof/Deck Fitting Details (cont.)

4. Gauge Hatch/Sample Well (8" diameter well)
- 1 Weighted Mechanical Actuation, Gasketed
- _____ Weighted Mechanical Actuation, Ungasketed

5. Ladder Well (36" diameter)
- _____ Sliding Cover, Gasketed
- _____ Sliding Cover, Ungasketed

6. Rim Vent (6" diameter)
- _____ Weighted Mechanical Actuation, Gasketed
- _____ Weighted Mechanical Actuation, Ungasketed

7. Roof Drain (3" diameter)
- _____ Open
- _____ 90% Close

8. Roof Leg (3" diameter leg)
- _____ Adjustable, Pontoon Area, Ungasketed
- _____ Adjustable, Center Area, Ungasketed
- 15 Adjustable, Double-Deck Roofs
- _____ Fixed
- _____ Adjustable, Pontoon Area, Gasketed
- _____ Adjustable, Pontoon Area, Sock
- _____ Adjustable, Center Area, Gasketed
- _____ Adjustable, Center Area, Sock

9. Roof Leg or Hang Well
- _____ Adjustable
- _____ Fixed

10. Sample Pipe (24" diameter)
- _____ Slotted Pipe – Sliding Cover, Gasketed
- _____ Slotted Pipe – Sliding Cover, Ungasketed
- _____ Slit Fabric Seal, 10% Open

11. Guided Pole/Sample Well
- _____ Ungasketed, Sliding Cover, Without Float
- _____ Ungasketed Sliding Cover, With Float
- _____ Gasketed Sliding Cover, Without Float
- _____ Gasketed Sliding Cover, With Float
- _____ Gasketed Sliding Cover, With Pole Sleeve
- _____ Gasketed Sliding Cover, With Pole Wiper
- _____ Gasketed Sliding Cover, With Float, Wiper
- _____ Gasketed Sliding Cover, With Float, Sleeve, Wiper
- _____ Gasketed Sliding Cover, With Pole Sleeve, Wiper

12. _____ **Stub Drain** (1" diameter)

13. Unslotted Guide – Pole Well
- _____ Ungasketed, Sliding Cover
- _____ Gasketed Sliding Cover
- _____ Ungasketed Sliding Cover with Sleeve
- _____ Gasketed Sliding Cover with Sleeve
- 1 Gasketed Sliding Cover with Wiper

14. Vacuum Breaker (10" diameter well)
- 1 Weighted Mechanical Actuation, Gasketed
- _____ Weighted Mechanical Actuation, Ungasketed

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: Marcia Baver Date: 3/12/13

Title: Project Manager Company Name: Environmental Audit Inc.

Name: Marcia Baverman

Phone #: (714) 632-8521 Fax #: (714) 632-6754

Email: mbaverman@envaudit.com

Contact Info

Name: John Matthews

Title: Env. Engineer Company Name: Philips 66

Phone #: (310) 952-6213 Fax #:

Email: John.Matthews@p66.com

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Address where the equipment will be operated (for equipment which will be moved to various locations in AQMD's jurisdiction, please list the initial location site): 1520 East Sepulveda Boulevard, Carson, CA 90745

(•) Fixed Location ( ) Various Locations

Tank Type (Select ONE)

( ) External Floating Roof Tank (EFRT) ( ) Internal Floating Roof Tank (IFRT) ( ) Horizontal Tank (HT)
( ) Vertical Fixed Roof Tank (VFRT) (•) Domed External Roof Tank (DEFRT)

Identification

Tank Identification Number: R-510

Tank Contents/Product (include MSDS): Crude Oil with 11 RVP

Section B - Tank Information

Tank Characteristics

Shell Diameter (ft.): 218
Shell Length (ft.):
Shell Height (ft.): 50
Turnovers Per Year: 64

Is Tank Heated? ( ) Yes (•) No
Is Tank Underground? ( ) Yes (•) No
Net Throughput (gal/year): 756MM
Self Support Roof: (•) Yes ( ) No

Number of Columns? 0
Effective Column Diameter: ( ) 9" by 7" Built Up Column - 1.1 ( ) 8" Diameter Pipe - 0.7 ( ) Unknown - 1

External Shell Condition: (•) Good ( ) Poor

Internal Shell Color: (•) Light Rust ( ) Dense Rust ( ) Gunite Lining

External Shell Color: (•) White/White ( ) Aluminum/Specular ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Gray/Medium ( ) Red/Primer

Average Liquid Height (ft.) (Vertical Only): 25
Maximum Liquid Height (ft.) (Vertical Only): 43
Working Volume (gal.) (Vertical Only): 11970000
Actual Volume (gal.) (Vertical Only): 13440000

Paint Condition: (•) Good ( ) Poor

Paint Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Roof Characteristics (Floating Roof Tank)

Roof Type: ( ) Pontoon ( ) Double Deck (•) Dome Roof (Height 42 ft.) ( ) Cone Roof (Height ____ ft.)

Roof Fitting Category: ( ) Typical (•) Detail

Roof Height (ft.):

Roof Paint Condition: (•) Good ( ) Poor

Roof Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Deck Characteristics (Floating Roof Tank)

Deck Type: (•) Welded ( ) Bolted

Deck Fitting Characteristics: ( ) Typical ( ) Detailed (Complete Deck Seam)

Construction:	Deck Seam Length (ft.):	Deck Seam:
( ) Sheet		( ) 5 ft. wide ( ) 6 ft. wide ( ) 7 ft. wide
( ) Panel		( ) 5 x 7.5 ft. ( ) 5 x 12 ft.

Tank Construction and Rim -Seal System (Floating Roof Tank)

Tank Construction: (•) Welded ( ) Riveted

Primary Seal: (•) Mechanical Shoe ( ) Liquid Mounted ( ) Vapor Mounted

Secondary Seal: (•) Rim Mounted ( ) None ( ) Shoe Mounted

Breather Vent Setting

Vacuum Setting (psig):
Pressure Setting (psig):

* Section D of the application MUST be completed.

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Storage Tank

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Section B - Tank Information (cont.)

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Nearest Major City: Long Beach

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Annual Average Solar Insulation Factor (Btu / (ft^3 * ft * day)): 1571.65

Tank Contents

Chemical Category: ○ Organic Liquids ◉ Crude Oil ○ Petroleum Distillates

Liquid: ○ Single ◉ Multiple

If Multiple, Select Speciation Option: ○ Full Speciation ◉ Partial Speciation ○ Various Weight Speciation ○ None

Section C - Operation Information

Vapor Control

Vapor Control During Loading or Unloading: ☐ Sparger ☐ Vapor Balance System ☐ Vapor Return Line ☐ Vented to Air Pollution Control Equipment [1]

[1] A separate permit is required. If APC equipment is already permitted, provide Permit or Device Number: _____

Vent Valve Data

Indicate Type of Setting and Vapor Disposal

	Number	Pressure Setting	Vaccum Setting	Discharging to (Check Appropriate Box)		
				Atmosphere	Vapor Control	Flare
Combination				☐	☐	☐
Pressure				☐	☐	☐
Vaccum				☐	☐	☐
Open				☐	☐	☐

Materials

Name all liquids, vapors, gases, or mixtures of such material to be stored in this tank:

Crude Oil

If material is stored in a solution, supply the following information:

Name of Solvent: _____ Name of Materials Dissolved: _____

Concentration of Materials Dissolved: _____ % by Weight OR _____ % by Volume OR _____ lbs/gal

Section D - Roof/Deck Fitting

Section D is required for the following tanks: External Floating Roof Tank, Internal Floating Roof Tanks, or Domed External Floating Roof Tanks.

Select the number of fittings for each applicable question. Examples: 3 Unbolted Cover, Ungasketed; _____ Unbolted Cover, Gasketed

Roof/Deck Fitting Details

1. Access Hatch (24" diameter well)
   - 2 Bolted Cover, Gasketed
   - _____ Unbolted Cover, UnGasketed
   - _____ Unbolted Cover, Gasketed

2. Automatic Gauge Float Well (20" diameter well)
   - 2 Bolted Cover, Gasketed
   - _____ Unbolted Cover, Ungasketed
   - _____ Unbolted Cover, Gasketed

3. Column Well (24" diameter well)
   - _____ Built-Up Col - Sliding Cover, Gasketed
   - _____ Built-Up Col - Sliding Cover, Ungasketed
   - _____ Pipe Col - Flex, Fabric Sleeve Seal
   - _____ Pipe Col - Sliding Cover, Gasketed
   - _____ Pipe Col - Sliding Cover, Ungasketed

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Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Section D - Roof/Deck Fitting (cont.)

Roof/Deck Fitting Details (cont.)

4. Gauge Hatch/Sample Well (8" diameter well)
- 1 Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

5. Ladder Well (36" diameter)
- 1 Sliding Cover, Gasketed
- ____ Sliding Cover, Ungasketed

6. Rim Vent (6" diameter)
- ____ Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

7. Roof Drain (3" diameter)
- ____ Open
- ____ 90% Close

8. Roof Leg (3" diameter leg)
- ____ Adjustable, Pontoon Area, Ungasketed
- ____ Adjustable, Center Area, Ungasketed
- ____ Adjustable, Double-Deck Roofs
- ____ Fixed
- 33 Adjustable, Pontoon Area, Gasketed
- ____ Adjustable, Pontoon Area, Sock
- 75 Adjustable, Center Area, Gasketed
- ____ Adjustable, Center Area, Sock

9. Roof Leg or Hang Well
- ____ Adjustable
- ____ Fixed

10. Sample Pipe (24" diameter)
- ____ Slotted Pipe – Sliding Cover, Gasketed
- ____ Slotted Pipe – Sliding Cover, Ungasketed
- ____ Slit Fabric Seal, 10% Open

11. Guided Pole/Sample Well
- ____ Ungasketed, Sliding Cover, Without Float
- ____ Ungasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, Without Float
- ____ Gasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, With Pole Sleeve
- ____ Gasketed Sliding Cover, With Pole Wiper
- ____ Gasketed Sliding Cover, With Float, Wiper
- ____ Gasketed Sliding Cover, With Float, Sleeve, Wiper
- ____ Gasketed Sliding Cover, With Pole Sleeve, Wiper

12. ____ **Stub Drain** (1" diameter)

13. Unslotted Guide – Pole Well
- ____ Ungasketed, Sliding Cover
- ____ Gasketed Sliding Cover
- ____ Ungasketed Sliding Cover with Sleeve
- ____ Gasketed Sliding Cover with Sleeve
- 1 Gasketed Sliding Cover with Wiper

14. Vacuum Breaker (10" diameter well)
- 2 Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: Marcia Baver Date: 3/13/13

Title: Project Manager Company Name: EAI

Name: Marcia Baverman

Phone #: (714) 632-8521 Fax #: (714) 632-6754

Email: mbaverman@envaudit.com

Contact Info

Name: John Matthews

Title: Env. Engineer Company Name: Philips 66

Phone #: (310) 952-6213 Fax #:

Email: John.Matthews@p66.com

THIS IS A PUBLIC DOCUMENT

Pursuant to the California Public Records Act, your permit application and any supplemental documentation are public records and may be disclosed to a third party. If you wish to claim certain limited information as exempt from disclosure because it qualifies as a trade secret, as defined in the District's Guidelines for Implementing the California Public Records Act, you must make such claim at the time of submittal to the District.

Check here if you claim that this form or its attachments contain confidential trade secret information. ☒

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South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): Phillips 66 Los Angeles Refinery, Carson Plant

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 171109

Address where the equipment will be operated (for equipment which will be moved to various locations in AQMD's jurisdiction, please list the initial location site): 1520 East Sepulveda Boulevard, Carson, CA 90745

(•) Fixed Location ( ) Various Locations

Tank Type (Select ONE)

( ) External Floating Roof Tank (EFRT) ( ) Internal Floating Roof Tank (IFRT) ( ) Horizontal Tank (HT)
( ) Vertical Fixed Roof Tank (VFRT) (•) Domed External Roof Tank (DEFRT)

Identification

Tank Identification Number: R-511

Tank Contents/Product (include MSDS): Crude Oil with 11 RVP

Section B - Tank Information

Tank Characteristics

Shell Diameter (ft.): 218

Shell Length (ft.):

Shell Height (ft.): 50

Turnovers Per Year: 64

Is Tank Heated? ( ) Yes (•) No

Is Tank Underground? ( ) Yes (•) No

Net Throughput (gal/year): 756MM

Self Support Roof: (•) Yes ( ) No

Number of Columns? 0

Effective Column Diameter: ( ) 9" by 7" Built Up Column - 1.1 ( ) 8" Diameter Pipe - 0.7 ( ) Unknown - 1

External Shell Condition: (•) Good ( ) Poor

Internal Shell Color: (•) Light Rust ( ) Dense Rust ( ) Gunite Lining

External Shell Color: (•) White/White ( ) Aluminum/Specular ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Gray/Medium ( ) Red/Primer

Average Liquid Height (ft.) (Vertical Only): 25

Maximum Liquid Height (ft.) (Vertical Only): 43

Working Volume (gal.) (Vertical Only): 11970000

Actual Volume (gal.) (Vertical Only): 13440000

Paint Condition: (•) Good ( ) Poor

Paint Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Roof Characteristics (Floating Roof Tank)

Roof Type: ( ) Pontoon (•) Dome Roof (Height 42 ft.) ( ) Double Deck ( ) Cone Roof (Height ____ ft.)

Roof Fitting Category: ( ) Typical (•) Detail

Roof Height (ft.):

Roof Paint Condition: (•) Good ( ) Poor

Roof Color/Shade: (•) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Deck Characteristics (Floating Roof Tank)

Deck Type: (•) Welded ( ) Bolted

Deck Fitting Characteristics: ( ) Typical ( ) Detailed (Complete Deck Seam)

Construction:	Deck Seam Length (ft.):	Deck Seam:
( ) Sheet		( ) 5 ft. wide ( ) 6 ft. wide ( ) 7 ft. wide
( ) Panel		( ) 5 x 7.5 ft. ( ) 5 x 12 ft.

Tank Construction and Rim -Seal System (Floating Roof Tank)

Tank Construction: (•) Welded ( ) Riveted

Primary Seal: (•) Mechanical Shoe ( ) Liquid Mounted ( ) Vapor Mounted

Secondary Seal: (•) Rim Mounted ( ) None ( ) Shoe Mounted

Breather Vent Setting

Vacuum Setting (psig):

Pressure Setting (psig):

* Section D of the application MUST be completed.

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South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section B - Tank Information (cont.)

Site Selection

Nearest Major City: Long Beach

Daily Average Ambient Temperature (°F): 64.31 Annual Average Minimum Temperature (°F): 54.40

Annual Average Maximum Temperature (°F): 74.22 Average Wind Speed (mph): 6.36

Annual Average Solar Insulation Factor (Btu / (ft^3 * ft * day)): 1571.65

Tank Contents

Chemical Category: ○ Organic Liquids ◉ Crude Oil ○ Petroleum Distillates

Liquid: ○ Single ◉ Multiple

If Multiple, Select Speciation Option: ○ Full Speciation ◉ Partial Speciation ○ Various Weight Speciation ○ None

Section C - Operation Information

Vapor Control

Vapor Control During Loading or Unloading: ☐ Sparger ☐ Vapor Balance System ☐ Vapor Return Line ☐ Vented to Air Pollution Control Equipment [1]

[1] A separate permit is required. If APC equipment is already permitted, provide Permit or Device Number: _____

Vent Valve Data

Indicate Type of Setting and Vapor Disposal

	Number	Pressure Setting	Vaccum Setting	Discharging to (Check Appropriate Box)		
				Atmosphere	Vapor Control	Flare
Combination				☐	☐	☐
Pressure				☐	☐	☐
Vaccum				☐	☐	☐
Open				☐	☐	☐

Materials

Name all liquids, vapors, gases, or mixtures of such material to be stored in this tank:
Crude Oil

If material is stored in a solution, supply the following information:

Name of Solvent: _____ Name of Materials Dissolved: _____

Concentration of Materials Dissolved: _____ % by Weight OR _____ % by Volume OR _____ lbs/gal

Section D - Roof/Deck Fitting

Section D is required for the following tanks: External Floating Roof Tank, Internal Floating Roof Tanks, or Domed External Floating Roof Tanks.

Select the number of fittings for each applicable question. Examples: 3 Unbolted Cover, Ungasketed; _____ Unbolted Cover, Gasketed

Roof/Deck Fitting Details

1. Access Hatch (24" diameter well)
   - 2 Bolted Cover, Gasketed
   - _____ Unbolted Cover, UnGasketed
   - _____ Unbolted Cover, Gasketed

2. Automatic Gauge Float Well (20" diameter well)
   - 2 Bolted Cover, Gasketed
   - _____ Unbolted Cover, Ungasketed
   - _____ Unbolted Cover, Gasketed

3. Column Well (24" diameter well)
   - _____ Built-Up Col - Sliding Cover, Gasketed
   - _____ Built-Up Col - Sliding Cover, Ungasketed
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Storage Tank

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Section D - Roof/Deck Fitting (cont.)

Roof/Deck Fitting Details (cont.)

4. Gauge Hatch/Sample Well (8" diameter well)
- 1 Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

5. Ladder Well (36" diameter)
- 1 Sliding Cover, Gasketed
- ____ Sliding Cover, Ungasketed

6. Rim Vent (6" diameter)
- ____ Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

7. Roof Drain (3" diameter)
- ____ Open
- ____ 90% Close

8. Roof Leg (3" diameter leg)
- ____ Adjustable, Pontoon Area, Ungasketed
- ____ Adjustable, Center Area, Ungasketed
- ____ Adjustable, Double-Deck Roofs
- ____ Fixed
- 33 Adjustable, Pontoon Area, Gasketed
- ____ Adjustable, Pontoon Area, Sock
- 75 Adjustable, Center Area, Gasketed
- ____ Adjustable, Center Area, Sock

9. Roof Leg or Hang Well
- ____ Adjustable
- ____ Fixed

10. Sample Pipe (24" diameter)
- ____ Slotted Pipe – Sliding Cover, Gasketed
- ____ Slotted Pipe – Sliding Cover, Ungasketed
- ____ Slit Fabric Seal, 10% Open

11. Guided Pole/Sample Well
- ____ Ungasketed, Sliding Cover, Without Float
- ____ Ungasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, Without Float
- ____ Gasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, With Pole Sleeve
- ____ Gasketed Sliding Cover, With Pole Wiper
- ____ Gasketed Sliding Cover, With Float, Wiper
- ____ Gasketed Sliding Cover, With Float, Sleeve, Wiper
- ____ Gasketed Sliding Cover, With Pole Sleeve, Wiper

12. ____ **Stub Drain** (1" diameter)

13. Unslotted Guide – Pole Well
- ____ Ungasketed, Sliding Cover
- ____ Gasketed Sliding Cover
- ____ Ungasketed Sliding Cover with Sleeve
- ____ Gasketed Sliding Cover with Sleeve
- 1 Gasketed Sliding Cover with Wiper

14. Vacuum Breaker (10" diameter well)
- 2 Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: Marcia Baverman Date: 3/12/13

Name: Marcia Baverman

Title: Project Manager

Company Name: Environmenal Audit Inc.

Phone #: (714) 632-8521 Fax #: (714) 632-6754

Email: mbaverman@envaudit.com

Contact Info

Name: John Matthews

Title: Env. Engineer

Company Name: Philips 66

Phone #: (310) 952-6213 Fax #:

Email: John.Matthews@p66.com

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Check here if you claim that this form or its attachments contain confidential trade secret information. ☒

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AQMD Form 400-E-GI

Philips 66 – Los Angeles Refinery Carson Plant
Facility ID No. 171109

Permit Application

Supplemental Information Package
Crude Oil Storage Capacity Project Tanks

Sections

1. Company Information
2. Background
3. Project Description
4. Equipment Location and Description
5. Operating Schedule
6. Emission Calculations
7. Evaluation and Rule Review
8. Proposed Permit Conditions
9. Confidentiality

Attachments

A Figures
B Emission Calculations
C Tank R510 NSR Balance
D Rule 1401 Analyses

March 11, 2013

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1. COMPANY INFORMATION

Mailing Address
1660 W. Anaheim St.
Wilmington, CA 90744

Site Location
Carson Plant
1520 E. Sepulveda Blvd.
Carson, CA 90745

2. BACKGROUND

The Philips 66 Los Angeles Refinery Carson Plant (LARC) operates crude supply storage tanks to handle incoming crude supplies from domestic as well as various sources from the Port of Long Beach, Berth 121.

LARC currently has four 320,000 barrel (BBL) receiving tanks (285,000 BBL net working capacity) for crude. These tanks usually store three segregated crude grades at a time, which essentially limits delivery volumes to Panamax vessels (400,000 BBL capacity). For larger vessels, such as Aframax (720,000 BBL) or Suezmax (1,000,000 BBL), LARC requires two ship calls to unload the full volume of the vessels, resulting in seven to 10 days of demurrage between ship calls. Between ship calls LARC makes room in the receiving tanks to accommodate the second discharge from the larger vessel. LARC needs more tankage and capacity to accommodate the larger vessels so they can discharge their total volume in one call.

3. PROJECT DESCRIPTION

The project will increase the onsite crude storage capacity by installing one new 575,000 BBL (500,000 BBL net working capacity) domed external floating roof crude tank (Tank 2640) and geodesic domes on two of the existing crude tanks (Tank R510 (Device D394) and Tank R511(Device D395)). The project also includes the construction of a new 11,500 BBL (10,000 BBL net working capacity) domed external floating roof water draw tank (Tank 2643).

Currently, the water draw from the existing crude tanks is processed in the sour water stripper which is at times overloaded. The water draw from the existing R510 and R511 tanks and new Tank 2640 will be routed to the new water draw Tank 2643. The new 11,500 BBL water draw tank will allow LARC to treat the water at the Brine Stripper, which has excess capacity. Minor modifications are required to prepare the water draw from Tank 2643 for delivery to the Brine Stripper, consisting of the installation of new heat exchangers and a steam trim heater to raise the temperature of the water before entering the Brine Stripper.

4. EQUIPMENT LOCATION AND TANK DESCRIPTION

The new tanks and tank modifications will be located at the western boundary of LARC. Table 1 shows the specifications of the existing and proposed tanks. Please refer to the Figures 1, 2, and 3 in Attachments A for locations.

TABLE 1
Tank Specifications

Tank Number	Roof Type	Commodity Type	Working Volume (BBL)	Diameter (ft)	Height (ft)	Dome Roof (ft)
Existing 510	Pontoon	Crude Oil	285,000	218	50	42
Existing 511	Pontoon	Crude Oil	285,000	218	50	42
Modified 510	Domed	Crude Oil RVP 7	285,000	218	50	42
Modified 511	Domed	Crude Oil RVP 7	285,000	218	50	42
New Tank 2640	Domed	Crude Oil RVP 7	500,000	260	64	55.5
New Tank 2643	Domed	Water/Crude	10,000	40	48	8.5

5. OPERATING SCHEDULE

	NORMAL	MAXIMUM
Hours/Day	24	24
Days/Week	7	7
Weeks/Year	52	52

6. EMISSION CALCULATIONS

The emissions for the tanks were calculated with the EPA TANKS 4.0.9d emissions model using a crude speciation for crude oil with a Reid Vapor Pressure of 11 (true vapor pressure 11 at 77 °F, see Figure 4). The peak daily emission rate was calculated by taking the maximum monthly value and converting to a daily rate. The new 575,000 BBL tanks will use 4" legs instead of the standard 3" legs. Since there are no established emission factors for non-standard sized legs, emissions were scaled based on the difference in circumference between the 3" legs and 4" legs. The fugitive emissions from components were calculated using the SCAQMD correlation equations. The emission calculations can be found in Attachment B.

7. EVALUATION AND RULE REVIEW

The proposed Project is designed to comply with the standards contained in the applicable State and Federal Rules and Regulations. The following provides a brief summary of the applicable regulations.

STATE REGULATIONS

Rule 301 – Permit Fees

Per the requirements of SCAQMD Rule 301, the application fee for the tanks is $12,040.21 (Schedule C – Storage Tank, with External Floating Roof). Expedited permit processing has been requested and an additional $6,020.11 will be submitted with the permit application fee. The total application and expedited fee for the permit application is $19,849.44.

Rule 403 – Fugitive Dust

The construction activities of the proposed project are regulated under SCAQMD Rule 403 which include requirements to minimize fugitive dust using best available control measures that include applying water or chemical stabilizers to active construction sites/unpaved roads, covering all haul vehicles, and so forth.

Rule 463 – Organic Liquid Storage

The crude storage tanks are regulated under SCAQMD Rule 463, which includes requirements to minimize fugitive VOC using best available control measures that include tanks construction standards.

Rule 466 – Pumps and Compressors

Rule 466 establishes inspection, tagging, and maintenance requirements for pumps and compressors. Pumps and compressors associated with all tanks will be included in the LARC Rule 1173 compliance program and will, therefore, comply with Rule 466.

Rule 466.1 – Valves and Flanges

Rule 466.1 establishes inspection, tagging, and maintenance requirements for valves and flanges. Valves and flanges associated with all tanks will be included in the LARC Rule 1173 monitoring program and will, therefore, comply with Rule 466.1.

Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants

The LARC currently complies with Rule 1173 and has a monitoring program for leaks. The new tanks will be incorporated into the existing plan.

Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities

Rule 1178 establishes tanks standards to control fugitive VOC emissions. The new and modified tanks associated with proposed Project will comply with Rule 1178.

Regulation XIII – New Source Review

The tanks are subject to Regulation XIII and are subject to requirements to provide emission offsets. Tanks R510 and R511 were permitted pursuant to Rule 213 with an NSR for Tank R510 identified as 103.7 lbs/day (See Attachment C). Since Tank R511 is identical to Tank R510, the total NSR balance for the tanks should be 207.4 lbs/day Pursuant to Rule 1304(c)(2) a concurrent emissions reduction can be used in lieu of providing offsets for the new equipment. As shown in Table 2, no additional offsets are required for this project.

TABLE 2
Emission Reduction Credits Summary

Tank No.	Emissions (lbs/day)
Post Project Emissions	
Modified Tank 510 Crude Tank	17.04
Modified Tank 511 Crude Tank	17.04
New Tank 2640 Crude Tank	21.24
New Tank 2643 Water Draw Tank	3.08
Fugitive Emissions	9.07
Total Project Emissions	67.47
NSR Balance for Tanks 510 and 511	207.4
Offsets Required	0

Rule 1401 – New Source Review for Toxic Air Contaminants

The tanks will store crude oil which contains chemicals listed under SCAQMD Rule 1401 and considered to be toxic air contaminants. The increase in toxic air contaminants is below the Rule 1401 screening thresholds for each of the four tanks. The Rule 1401 screening analyses are included in Attachment D.

Regulation XX - RECLAIM

The facility is subject to RECLAIM, however, the project only generates VOC emissions, which is not a RECLAIM pollutant. Therefore, no RECLAIM emissions are emitted from this project.

Regulation XXX - Title V Permits

The facility is a Title V facility. Permit modification applications are included in this application package to modify the facility Title V permit. The Title V permit modification qualifies as a significant permit revision pursuant to SCAQMD Rule 3000(b)(31)(I).

FEDERAL REGULATIONS

The federal regulations applicable to the new tanks are as follows:

40 CFR 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984

40 CFR 60 Subpart GGGa – Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After November 7, 2006

40 CFR 61 Subpart V – National Emission Standards for Equipment Leaks (Fugitive Emission Sources)

40 CRF 61 subpart FF – National Emission Standards for Benzene Waste Operations

40 CFR 63 Subpart H – National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks

40 CFR 63 Subpart CC – National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries

The federal regulations, while not identical to the state regulations, are similar to state regulations. The new and modified tanks are designed to comply with BACT requirements, the SCAQMD rules and regulations, and federal regulations. Therefore, the new and modified tanks are expected to comply with applicable subparts of the federal regulations.

8. PROPOSED PERMIT CONDITIONS

Below are the proposed permit conditions for throughput and monitoring of the tanks. These conditions should replace condition C1.17 for existing Tanks 510 and 511, and should read:

The operator shall limit the throughput to no more than 1,500,000 barrel(s) in any one calendar month.

The operator shall calculate the throughput, in barrels, by the following equation:

0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The operator shall keep adequate records to show compliance with the limitations specified in this permit.

The conditions for new Tank 2640 should read:

The operator shall limit the throughput to no more than 2,500,000 barrel(s) in any one calendar month.

The operator shall calculate the throughput, in barrels, by the following equation:

0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The operator shall keep adequate records to show compliance with the limitations specified in this permit.

The conditions for new Tanks 2643 should read:

The operator shall limit the throughput to no more than 64,000 barrel(s) in any one calendar month.

The operator shall calculate the throughput, in barrels, by the following equation:

0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The operator shall keep adequate records to show compliance with the limitations specified in this permit.

9. CONFIDENTIALITY

Certain information supplied on the attached sheets concerning process operating conditions, material balances, and process descriptions constitutes confidential and proprietary information under Government Code Section 6254.7. Philips 66 justifies classification of such data as trade secrets because the information contains production data and operating procedures, and therefore would potentially release competitively sensitive information, which would be of considerable value to competitors. Therefore, we request that all such data be handled in confidence.

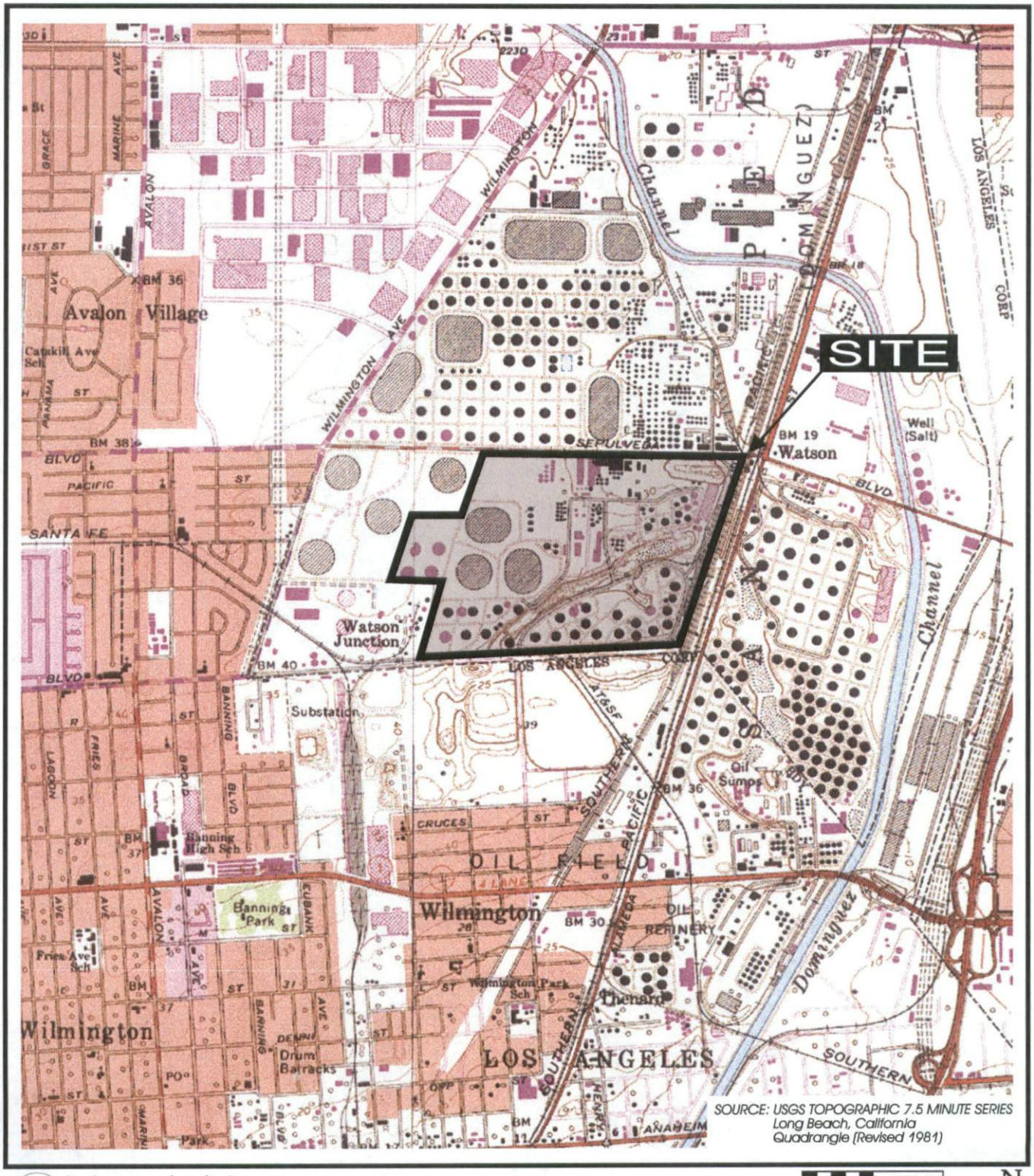
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ATTACHMENT A

Figures

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Environmental Audit, Inc.

0 2,000'

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SITE LOCATION MAP
Phillips 66 Los Angeles Refinery
Carson Plant

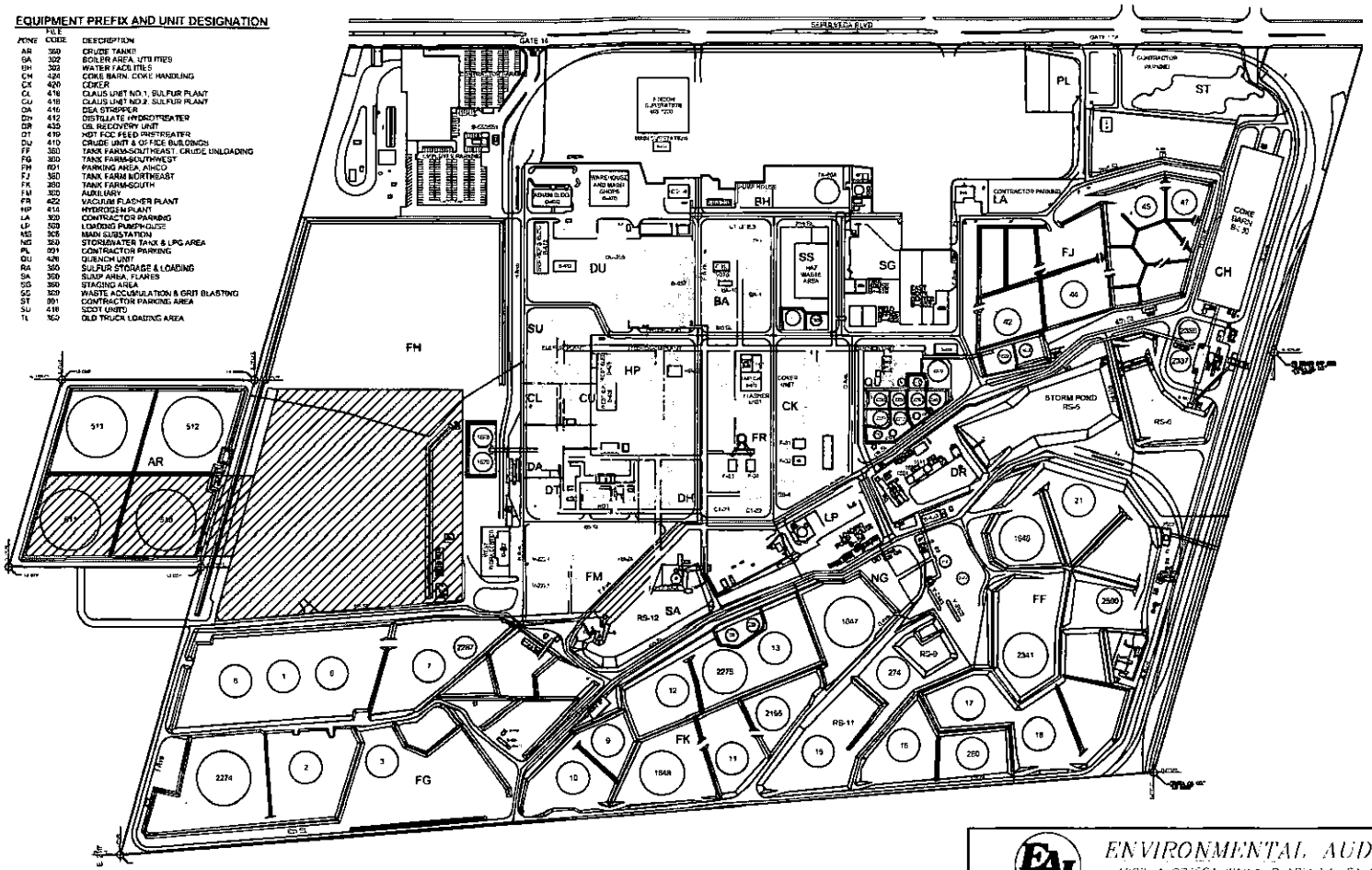
Project No. 2778

Figure 1

N:\2778\SiteLocMap (Carson).cdr

EQUIPMENT PREFIX AND UNIT DESIGNATION

ZONE	FILE CODE	DESCRIPTION
AR	360	CRUDE TANKS
BA	302	BOILER AREA, UTILITIES
BH	302	WATER FACILITIES
CH	424	COKE BARN, COKE HANDLING
CK	420	COKER
CL	416	CLAUS UNIT NO.1, SULFUR PLANT
CU	416	CLAUS UNIT NO.2, SULFUR PLANT
DA	416	DEA STRIPPER
DH	412	DISTILLATE HYDROTREATER
DR	435	OIL RECOVERY UNIT
DT	419	HOT FOC FEED PRETREATER
DU	410	CRUDE UNIT & OFFICE BUILDINGS
FF	360	TANK FARM-SOUTHEAST, CRUDE UNLOADING
FG	360	TANK FARM-SOUTHWEST
FH	601	PARKING AREA, AHCO
FJ	360	TANK FARM NORTHEAST
FK	360	TANK FARM-SOUTH
FM	360	AUXILIARY
FR	422	VACUUM FLASHER PLANT
HP	414	HYDROGEN PLANT
LA	930	CONTRACTOR PARKING
LP	928	LOADING PUMPHOUSE
MS	368	MAIN SUBSTATION
NG	360	STORMWATER TANK & LPG AREA
PL	601	CONTRACTOR PARKING
QU	426	QUENCH UNIT
RA	360	SULFUR STORAGE & LOADING
SA	360	SLOP AREA, FLARES
SG	360	STAGING AREA
SS	369	WASTE ACCUMULATION & GRIT BLASTING
ST	601	CONTRACTOR PARKING AREA
SU	418	SCOT UNITS
TL	160	OLD TRUCK LOADING AREA



LEGEND:

(13) NUMBERS IN AND AROUND OBJECTS REPRESENT INDIVIDUAL TANK NUMBERS

PROPOSED PROJECT AREA

NORTH

0 400'

SCALE

ENVIRONMENTAL AUDIT, INC.
1000-A ORTEGA WAY • PLACENTIA, CA 92870-7125
714/632-8021 • FAX: 714/632-6754

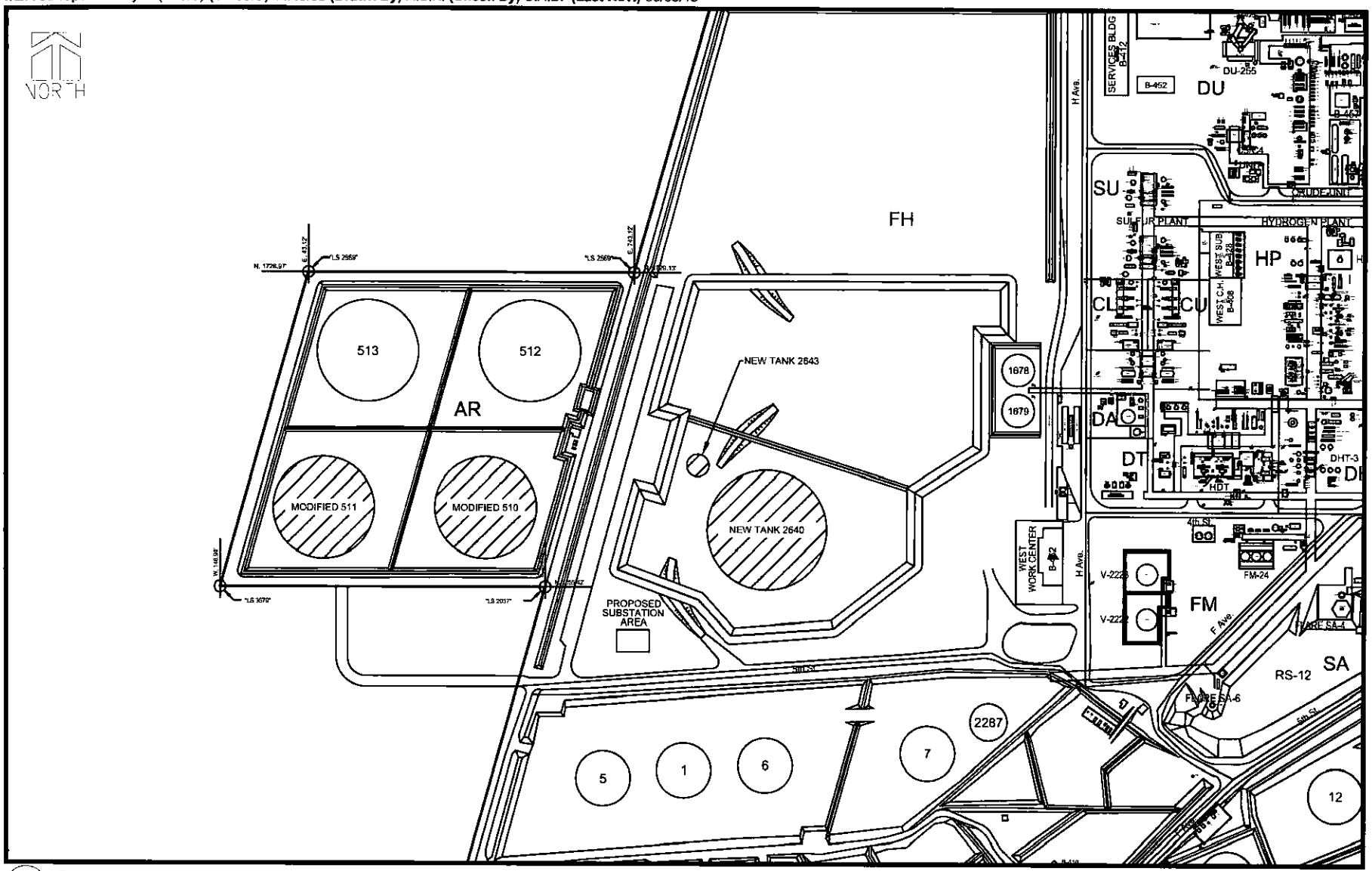
SITE PLAN - PHILLIPS 66 LOS ANGELES REFINERY

DRAWN BY	DATE CREATED
M.B.	11/19/03
CHECKED	LAST REV
DBS	06/11/12
SIZE	
17x11	
FILE NAME	
I:\2778\Site Plan Carson Plant (rev.2)	

CARSON PLANT
1520 E. SEPULVEDA BLVD.
Carson, California

Figure 2

I:\2778\Proposed Project (rev.6a) **(Created)** 11/19/03 **(Drawn By)** A.S.K. **(Check By)** S.A.B. **(Last Rev.)** 03/08/13

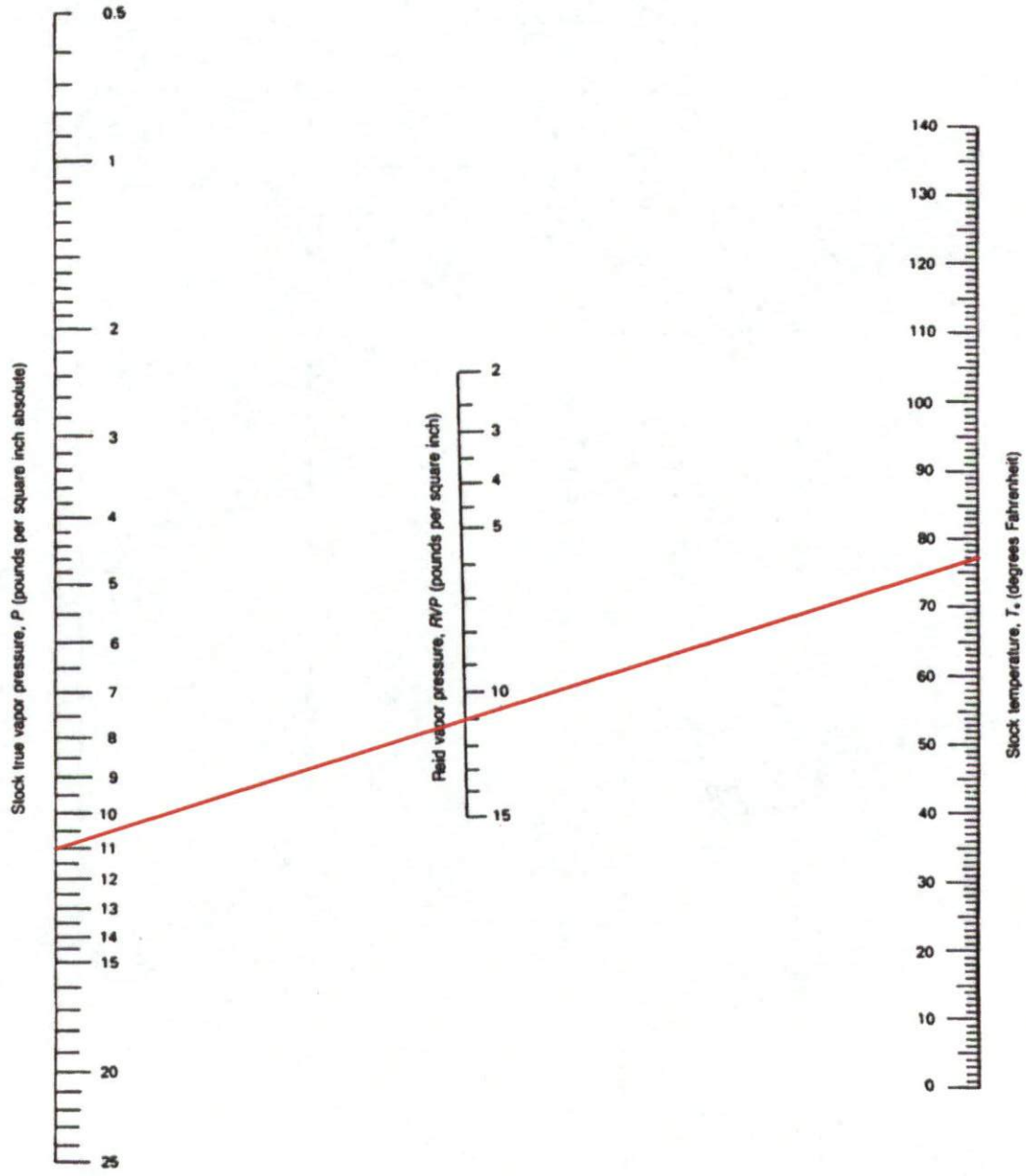


Environmental Audit, Inc.

PROPOSED PROJECT PLAN
Phillips 66 Los Angeles Refinery
Carson Plant

Project No. 2778

Figure 3



True vapor pressure of crude oils with a Reid vapor pressure of 2 to 15 pounds per square inch.

SOURCE: AP42 Figure 7.1-13a (November 2006)

Environmental Audit, Inc.

Nomograph of Crude Oil Vapor Pressure

Project No. 2778

Figure 4

M:\MC\2778\Emission Factors (rev.2).cdr

ATTACHMENT B

Emission Calculations

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Attachment B
Emissions Calculations

Phillips 66 Carson Plant
Crude Oil Capacity Project

Component Count

Process Unit: **Philips 66 Carson Plant New Crude Tank 2640**

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm) Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	190	0.00	0	0
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	14	4.55	0	63.64
		Light Liquid (4)	0	0	83	4.55	0	377.30
		Heavy Liquid (5)	0	0		4.55	0	-
		> 8 inches	0	0			0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	5	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	2	46.83	0	
Compressors		Gas / Vapor	0	0		9.09	-	
Flanges (ANSI 16.5-1988)		All	0	0	258	6.99	-	1,803.47
Connectors		All	0	0	134	2.86	-	383.43
Pressure Relief Valves		All	0	0	8		0	-
Process Drains with P-Trap or Seal Pot		All	0	0	0	9.09	-	
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	7	9.09	-	
Total Emissions		lb/year					-	2,628
		lbs/day					0	7.20

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Attachment B
Emissions Calculations

Phillips 66 Carson Plant
Crude Oil Capacity Project

Component Count

Process Unit: Philips 66 Carson Plant New Crude Tank 2643

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm) Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	61	0.00	0	0
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	0	4.55	0	-
		Light Liquid (4)	0	0	16	4.55	0	72.73
		Heavy Liquid (5)	0	0	0	4.55	0	-
		> 8 inches	0	0	0		0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	0	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	0	46.83	0	
Compressors		Gas / Vapor	0	0	0	9.09	-	
Flanges (ANSI 16.5-1988)		All	0	0	79	6.99	-	552.22
Connectors		All	0	0	20	2.86	-	57.23
Pressure Relief Valves		All	0	0	0		0	-
Process Drains with P-Trap or Seal Pot		All	0	0	0	9.09	-	
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	1	9.09	-	
Total Emissions		lb/year					-	682
		lbs/day					0	1.87

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification. this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Fugitive Component Emissions

		Tank 2640			Tank 2643		
Chemical	Crude Vapor Wt%	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	2.83	7.44E+01	0.20	8.50E-03	19.33	0.05	2.21E-03
PACs (Chrysene)	0.00	3.56E-05	0.00	4.06E-09	9.24E-06	0.00	1.06E-09
Cresol (mixed isomers)	0.00	4.28E-05	0.00	4.89E-09	1.11E-05	0.00	1.27E-09
Ethylbenzene	0.13	3.29E+00	0.01	3.76E-04	8.55E-01	0.00	9.76E-05
n-Hexane	38.55	1012.95	2.78	1.16E-01	262.96	0.72	3.00E-02
Naphthalene	0.00	2.26E-02	0.00	2.58E-06	5.87E-03	0.00	6.71E-07
Phenol	0.00	1.02E-04	0.00	1.16E-08	2.64E-05	0.00	3.01E-09
Toluene	1.01	2.66E+01	0.07	3.04E-03	6.90	0.02	7.88E-04
Xylene (mixed isomers)	0.19	5.09E+00	0.01	5.81E-04	1.32E+00	0.00	1.51E-04
Cumene	0.00	7.03E-03	0.00	8.02E-07	0.00	0.00	2.08E-07
Cyclohexane	19.14	503.08	1.38	5.74E-02	130.60	0.36	1.49E-02
1,2,4-Trimethylbenzene	0.01	3.28E-01	0.00	3.74E-05	8.51E-02	0.00	9.71E-06
Total VOC	100.00	2.63E+03	7.20	3.00E-01	682.18	1.87	7.79E-02

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Tank Working Loss Emissions

	Tank 2640[1]			Tank 2643			Tank R510/R511		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	8.99	0.0246	1.03E-03	1.36	0.0037	1.55E-04	6.96	0.0191	7.945E-04
PACs (Chrysene)	0.09	0.0002	1.03E-05	0.02	0.0001	2.28E-06	0.07	0.0002	7.991E-06
Cresol (mixed isomers)	0.03	0.0001	3.42E-06	-	-	0.00E+00	0.02	0.0001	2.283E-06
Ethylbenzene	7.17	0.0197	8.19E-04	1.18	0.0032	1.35E-04	5.17	0.0142	5.902E-04
n-Hexane	66.34	0.1818	7.57E-03	9.68	0.0265	1.11E-03	52.95	0.1451	6.045E-03
Naphthalene	4.24	0.0116	4.84E-04	0.71	0.0019	8.11E-05	3.03	0.0083	3.459E-04
Phenol	0.01	0.0000	1.14E-06	-	-	0.00E+00	0.01	0.0000	1.142E-06
Toluene	29.63	0.0812	3.38E-03	4.77	0.0131	5.45E-04	21.79	0.0597	2.487E-03
Xylene (mixed isomers)	45.09	0.1235	5.15E-03	7.43	0.0204	8.48E-04	32.47	0.0890	3.707E-03
Cumene	0.12	0.0003	1.37E-05	0.02	0.0001	2.28E-06	0.08	0.0002	9.132E-06
Cyclohexane	46.25	0.1267	5.28E-03	7.04	0.0193	8.04E-04	35.69	0.0978	4.074E-03
1,2,4-Trimethylbenzene	13.13	0.0360	1.50E-03	2.18	0.0060	2.49E-04	9.39	0.0257	1.072E-03
Total VOC	7,463.99	20.4493	8.52E-01	1087.84	2.9804	1.24E-01	5963.21	16.3376	6.807E-01

(1) Tank leg emissions scaled for 4" legs.

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Total Tank Operational Emissions

	Tank 2640			Tank 2643		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	83.43	0.2286	0.0095	20.69	0.0567	0.0024
PACs (Chrysene)	0.09	0.0002	0.0000	0.02	0.0001	0.0000
Cresol (mixed isomers)	0.03	0.0001	0.0000	0.00	0.0000	0.0000
Ethylbenzene	10.47	0.0287	0.0012	2.03	0.0056	0.0002
n-Hexane	1,079.29	2.9570	0.1232	272.64	0.7470	0.0311
Naphthalene	4.26	0.0117	0.0005	0.72	0.0020	0.0001
Phenol	0.01	0.0000	0.0000	0.00	0.0000	0.0000
Toluene	56.22	0.1540	0.0064	11.67	0.0320	0.0013
Xylene (mixed isomers)	50.18	0.1375	0.0057	8.75	0.0240	0.0010
Cumene	0.13	0.0003	0.0000	0.02	0.0001	0.0000
Cyclohexane	549.33	1.5050	0.0627	137.64	0.3771	0.0157
1,2,4-Trimethylbenzene	13.46	0.0369	0.0015	2.27	0.0062	0.0003
Total VOC	10,091.82	27.6488	1.1520	1,770.02	4.8494	0.2021

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2640 legged
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	500000 bbl domed tank (working capacity)

Tank Dimensions

Diameter (ft):	260.00
Volume (gallons):	21,000,000.00
Turnovers:	60.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	6
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	260
Automatic Gauge Float Well/Bolted Cover, Gasketed	3
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

2640 legged - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4580	N/A	N/A	49.6923	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0085	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6072	N/A	N/A	49.6889	0.9618	0.9851	215.18	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7607	N/A	N/A	49.6854	0.9618	0.9850	215.18	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0087	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0602	N/A	N/A	49.6787	0.9618	0.9847	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3098	N/A	N/A	49.6732	0.9618	0.9844	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0658	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5857	N/A	N/A	49.6671	0.9618	0.9841	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9635	N/A	N/A	49.6589	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0215	N/A	N/A	49.6577	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7812	N/A	N/A	49.6629	0.9618	0.9839	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3880	N/A	N/A	49.6715	0.9618	0.9843	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8423	N/A	N/A	49.6836	0.9618	0.9849	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4544	N/A	N/A	49.6924	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2640 legged - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	57.6988	59.1515	60.6795	63.7603	66.4370	69.5218	73.9825	74.6934	71.7943	67.2977	61.5048	57.6642
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph) ^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673
Net Throughput (gal/mo.):	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Roof Fitting Losses (lb):	124.1523	127.2782	130.5660	137.1950	142.9545	149.5922	159.1904	160.7200	154.4819	144.8065	132.3418	124.0778
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	568.1184	572.6970	577.5129	587.2226	595.6589	605.3813	619.4401	621.6807	612.5435	598.3716	580.1140	568.0093

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	6	6.20	1.20	0.94	187.1033
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	70.4152
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	260	0.82	0.53	0.14	1,072.3230
Automatic Gauge Float Well/Bolted Cover, Gasketed	3	2.80	0.00	0.00	42.2491
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	32.1898
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	281.6608

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2640 legged - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	784.19	4,635.21	1,687.36	0.00	7,106.75
1,2,4-Trimethylbenzene	0.03	13.04	0.05	0.00	13.12
Benzene	0.68	6.55	1.45	0.00	8.68
Chrysene	0.00	0.09	0.00	0.00	0.09
Cresol (-m)	0.00	0.03	0.00	0.00	0.03
Cumene	0.00	0.11	0.00	0.00	0.12
Cyclohexene	3.31	34.30	7.13	0.00	44.74
Ethylbenzene	0.07	6.92	0.15	0.00	7.14
Hexane (-n)	6.91	41.41	14.87	0.00	63.19
Naphthalene	0.00	4.24	0.00	0.00	4.24
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	0.80	26.76	1.72	0.00	29.27
Unidentified Components	772.03	4,457.98	1,661.19	0.00	6,891.20
Xylenes (mixed isomers)	0.37	43.76	0.79	0.00	44.92

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2640 legless
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	500000 bbl domed tank (working capacity) - Legless

Tank Dimensions

Diameter (ft):	260.00
Volume (gallons):	21,000,000.00
Turnovers:	60.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	6
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Automatic Gauge Float Well/Bolted Cover, Gasketed	3
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

2640 legless - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4580	N/A	N/A	49.6923	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0085	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6072	N/A	N/A	49.6889	0.9618	0.9851	215.18	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7607	N/A	N/A	49.6854	0.9618	0.9850	215.18	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0087	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0802	N/A	N/A	49.6787	0.9618	0.9847	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0529	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3098	N/A	N/A	49.6732	0.9618	0.9844	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0568	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5857	N/A	N/A	49.6671	0.9618	0.9841	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9635	N/A	N/A	49.6589	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0215	N/A	N/A	49.6577	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7812	N/A	N/A	49.6629	0.9618	0.9839	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3880	N/A	N/A	49.6715	0.9618	0.9843	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8423	N/A	N/A	49.6836	0.9618	0.9849	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4544	N/A	N/A	49.6924	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2640 legless - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	57.6988	59.1515	60.6795	63.7603	66.4370	69.5218	73.9825	74.6934	71.7943	67.2977	61.5048	57.6642
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph) ^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673
Net Throughput (gal/mo.):	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Roof Fitting Losses (lb):	45.2973	46.4377	47.6373	50.0559	52.1573	54.5791	58.0810	58.6391	56.3631	52.8330	48.2852	45.2701
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	489.2634	491.8566	494.5842	500.0835	504.8616	510.3682	518.3308	519.5997	514.4247	505.3980	496.0574	489.2016

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	6	6.20	1.20	0.94	187.1033
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	70.4152
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Automatic Gauge Float Well/Bolted Cover, Gasketed	3	2.80	0.00	0.00	42.2491
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	32.1898
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	281.6608

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2640 legless - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	784.19	4,635.21	615.64	0.00	6,035.03
1,2,4-Trimethylbenzene	0.03	13.04	0.02	0.00	13.08
Benzene	0.68	6.55	0.53	0.00	7.76
Chrysene	0.00	0.09	0.00	0.00	0.09
Cresol (-m)	0.00	0.03	0.00	0.00	0.03
Cumene	0.00	0.11	0.00	0.00	0.12
Cyclohexene	3.31	34.30	2.60	0.00	40.21
Ethylbenzene	0.07	6.92	0.05	0.00	7.04
Hexane (-n)	6.91	41.41	5.43	0.00	53.74
Naphthalene	0.00	4.24	0.00	0.00	4.24
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	0.80	26.76	0.63	0.00	28.18
Unidentified Components	772.03	4,457.98	606.09	0.00	5,836.10
Xylenes (mixed isomers)	0.37	43.76	0.29	0.00	44.42

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	T2643
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	10000bbl (working capacity) domed water surge tank

Tank Dimensions

Diameter (ft):	40.00
Volume (gallons):	420,000.00
Turnovers:	76.80

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	15

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T2643 - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8851, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4580	N/A	N/A	49.6923	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8851, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0085	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6072	N/A	N/A	49.6889	0.9618	0.9851	215.18	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8851, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7607	N/A	N/A	49.6854	0.9618	0.9850	215.18	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0087	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0602	N/A	N/A	49.6787	0.9618	0.9847	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3098	N/A	N/A	49.6732	0.9618	0.9844	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0658	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5857	N/A	N/A	49.6671	0.9618	0.9841	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9635	N/A	N/A	49.6589	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0215	N/A	N/A	49.6577	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7812	N/A	N/A	49.6629	0.9618	0.9839	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3880	N/A	N/A	49.6715	0.9618	0.9843	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8423	N/A	N/A	49.6836	0.9618	0.9849	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4544	N/A	N/A	49.6924	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0951	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T2643 - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	8.8767	9.1002	9.3353	9.8093	10.2211	10.6957	11.3819	11.4913	11.0453	10.3535	9.4623	8.8714
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Vapor Molecular Weight (lb/lb-mols):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749
Net Throughput (gal/mo.):	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Roof Fitting Losses (lb):	14.4136	14.7765	15.1582	15.9278	16.5965	17.3671	18.4814	18.6590	17.9348	16.8115	15.3644	14.4050
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	87.5652	88.1516	88.7684	90.0120	91.0924	92.3376	94.1382	94.4251	93.2549	91.4399	89.1015	87.5513

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	16.0949
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	14.0830
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	31.1839
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	70.4152
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	15	0.82	0.53	0.14	61.8648

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T2643 - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	120.64	771.30	195.90	0.00	1,087.84
1,2,4-Trimethylbenzene	0.00	2.17	0.01	0.00	2.18
Benzene	0.10	1.09	0.17	0.00	1.36
Chrysene	0.00	0.02	0.00	0.00	0.02
Cresol (-m)	0.00	0.00	0.00	0.00	0.00
Cumene	0.00	0.02	0.00	0.00	0.02
Cyclohexene	0.51	5.71	0.83	0.00	7.04
Ethylbenzene	0.01	1.15	0.02	0.00	1.18
Hexane (-n)	1.06	6.89	1.73	0.00	9.68
Naphthalene	0.00	0.71	0.00	0.00	0.71
Phenol	0.00	0.00	0.00	0.00	0.00
Toluene	0.12	4.45	0.20	0.00	4.77
Unidentified Components	118.77	741.81	192.86	0.00	1,053.44
Xylenes (mixed isomers)	0.06	7.28	0.09	0.00	7.43

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	R510/511
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	285000 bbl tank (working capacity)

Tank Dimensions

Diameter (ft):	218.60
Volume (gallons):	11,970,000.00
Turnovers:	63.16

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Shoe-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	77
Automatic Gauge Float Well/Bolted Cover, Gasketed	2
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

R510/511 - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4580	N/A	N/A	49.6923	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0085	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6072	N/A	N/A	49.6889	0.9618	0.9851	215.18	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7607	N/A	N/A	49.6854	0.9618	0.9850	215.18	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777

Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0087	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0602	N/A	N/A	49.6787	0.9618	0.9847	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3098	N/A	N/A	49.6732	0.9618	0.9844	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3950	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5857	N/A	N/A	49.6671	0.9618	0.9841	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9635	N/A	N/A	49.6589	0.9618	0.9837	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0215	N/A	N/A	49.6577	0.9618	0.9837	215.18	

Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7812	N/A	N/A	49.6629	0.9618	0.9839	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6052	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0089	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3880	N/A	N/A	49.6715	0.9618	0.9843	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0086	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8423	N/A	N/A	49.6836	0.9618	0.9849	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4544	N/A	N/A	49.6924	0.9618	0.9853	215.18	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d

Emissions Report - Detail Format

Detail Calculations (AP-42)

R510/511 - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	129.3637	132.6208	136.0486	142.9539	148.9552	155.8714	165.8725	167.4663	160.9664	150.8849	137.8970	129.2861
Seal Factor A (lb-mole/ft-yr):	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528
Net Throughput (gal/mo.):	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000
Roof Fitting Losses (lb):	66.0133	67.6754	69.4236	72.9483	76.0107	79.5401	84.6435	85.4569	82.1400	76.9955	70.3678	65.9738
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	471.0288	475.9490	481.1230	491.5550	500.6187	511.0643	526.1688	528.5760	518.7592	503.5332	483.9176	470.9127

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	18.0949
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	9.0534
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34	1.30	0.08	0.65	222.3109
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	62.3678
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	281.6608
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	77	0.53	0.11	0.13	205.2603
Automatic Gauge Float Well/Bolted Cover, Gasketed	2	2.80	0.00	0.00	28.1661
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	70.4152

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

R510/511 - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	1,758.18	3,307.83	897.19	0.00	5,963.21
1,2,4-Trimethylbenzene	0.06	9.30	0.03	0.00	9.39
Benzene	1.51	4.68	0.77	0.00	6.96
Chrysene	0.00	0.07	0.00	0.00	0.07
Cresol (-m)	0.00	0.02	0.00	0.00	0.02
Cumene	0.00	0.08	0.00	0.00	0.08
Cyclohexene	7.43	24.48	3.79	0.00	35.69
Ethylbenzene	0.16	4.94	0.08	0.00	5.17
Hexane (-n)	15.49	29.55	7.91	0.00	52.95
Naphthalene	0.00	3.03	0.00	0.00	3.03
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	1.79	19.09	0.91	0.00	21.79
Unidentified Components	1,730.92	3,181.36	883.28	0.00	5,795.56
Xylenes (mixed isomers)	0.82	31.23	0.42	0.00	32.47

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ATTACHMENT C

Tank R510 NSR Balance

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572-6321

November 13, 1980

Shell Oil Company
P. O. Box 6249
Carson, CA 90749

Attention: Environmental Conservation Manager

Dear Sir:

Transmitted herewith are the following permits authorizing you to operate the described equipment: 1622 EAST SEPULVEDA BLVD, CARSON

Permit No.	Application No.	Equipment Description
M-12199	C-18847	STORAGE TANK NO. R-513
M-12200	C-18848	STORAGE TANK NO. R-512
M-12251	C-18849	STORAGE TANK NO. R-511
M-12252	C-18850	STORAGE TANK NO. R-510

Rule 203 A person granted a permit under Rule 203 shall not operate or use any equipment unless the entire permit to operate or a legible facsimile of the entire permit is affixed upon the equipment in such a manner that the permit number equipment description and the specified operating conditions are clearly visible and accessible In the event that the equipment is so constructed that the permit to operate or the legible facsimile cannot be so placed the entire permit to operate or the legible facsimile of the entire permit shall be mounted so as to be clearly visible in an accessible place within 8 meters (26 feet) of the equipment or as otherwise approved by the Air Pollution Control Officer

These permits are being issued covering your application on file at the Air Quality Management District.

Very truly yours,

Eric E. Lemke
Chief Deputy Executive Officer

EEL:HT:la
Encs.

Helen Thompson, Permit Section

Rev. 8/78 30D170

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
METROPOLITAN ZONE

ENGINEERING DIVISION - APPLICATION EMISSION DATA SHEET

☑ P/C ☑ Basic Including Spray Booths ☐ Trade-offs ☑ Rule Reduction DATE: 7/10/78

☐ P/O ☐ Control Except Spray Booths ☐ Recall APPL. NO.: C-18850

NAME: SHELL OIL COMPANY

ADDRESS: 1622 EAST SEPULVEDA BLVD., CARSON 90749

☑ Rule 213 Applicable (unit installed or permit to construct issued on or subsequent to 10/8/76).

☐ Rule 213 Not Applicable (unit installed or permit to construct issued prior to 10/8/76, or previously exempt by Rule 219).

Emissions From This Permit Unit

(Complete for basic equipment and spray booths only)

Contaminant	THC	NO_x	SO_2	CO	Part.
Lbs/Hr	4.3	—	—	—	—
Lbs/Day	103.7	—	—	—	—

Altered Permit Unit ☑ Yes ☐ No Prior Permit Number or Date Installed Without Permit PRIOR APPL NO'S: C-03789 (AREO) P/C < 10/8/76 C-08256 (SHELL)

(Complete for basic equipment and spray booths only)

Emissions from previous permit unit:

Contaminant	THC	NO_x	SO_2	CO	Part.
Lbs/Hr	~~16.6~~	—	—	—	—
Lbs/Day	~~398.4~~	—	—	—	—

Mitigations (on premise reductions) Achieved Concurrent With This Application

(Also complete for control equipment except spray booths)

Appl. No	H/C Total		NO_x		SO_2		CO		Part.	
	#/Hr	#/Day	#/Hr	#/Day	#/Hr	#/Day	#/Hr	#/Day	#/Hr	#/Day

BACT Evaluation Not Made ☑ Made ☐ in Appl. _____ Date _____

Stationary Source (Entire Facility) Employs BACT Yes ☐ No ☐ UNKNOWN

Engineer _____

ATTACHMENT D

Rule 1401 Analysis

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TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	T2640
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	64	feet
Area (For Volume Source Only)	53100	ft^2
Distance-Residential	750	meters
Distance-Commercial	175	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
[redacted]e output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
B1	Benzene (including benzene from gasoline)	9.52E-03	78.11	0.009524333		0.009524333
P15	Chrysene	1.03E-05	228.2928	1.0278E-05		1.0278E-05
C30	Cresol mixtures	3.43E-06	108.14	3.42955E-06		3.42955E-06
E4	Ethyl benzene	1.19E-03	106.16	0.001194836		0.001194836
H8	Hexane (n-)	1.23E-01	86.18	0.123207131		0.123207131
P30	Naphthalene	4.87E-04	128.1732	0.000486601		0.000486601
P3	Phenol	1.15E-06	94.11	1.15315E-06		1.15315E-06
T3	Toluene (methyl benzene)	6.42E-03	92.13	0.006418356		0.006418356
X1	Xylenes (isomers and mixtures)	5.73E-03	106.2	0.005727946		0.005727946
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[redacted]				0		
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TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	T2640
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors table:

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.25	13.3
Commercial	2.6475	80.25

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

D-2

Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	9.52E-03	9.52E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	1.03E-05	1.03E-05	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	3.43E-06	3.43E-06		1	1	1	1.0000	600	
Ethyl benzene	1.19E-03	1.19E-03	8.70E-03	1	1	1	1	2000	
Hexane (n-)	1.23E-01	1.23E-01		1.0000	1.0000	1	1	7000	
Naphthalene	4.87E-04	4.87E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	1.15E-06	1.15E-06		1	1	1	1	200	5800
Toluene (methyl benzene)	6.42E-03	6.42E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	5.73E-03	5.73E-03		1.0000	1.0000	1	1	700	22000

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	9.52E-03	9.52E-03	83.20457	0.041602285
Chrysene	1.03E-05	1.03E-05	0.08978893	4.48945E-05
Cresol mixtures	3.43E-06	3.43E-06	0.02996053	1.49803E-05
Ethyl benzene	1.19E-03	1.19E-03	10.4380882	0.005219044
Hexane (n-)	1.23E-01	1.23E-01	1076.3375	0.538168749
Naphthalene	4.87E-04	4.87E-04	4.25094833	0.002125474
Phenol	1.15E-06	1.15E-06	0.01007388	5.03694E-06
Toluene (methyl benzene)	6.42E-03	6.42E-03	56.0707589	0.028035379
Xylenes (isomers and mixtures)	5.73E-03	5.73E-03	50.0393323	0.025019666

A/N: T2640 Application deemed complete date: 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	2.99E-07	6.17E-07
Chrysene	3.74E-09	3.80E-09
Cresol mixtures		
Ethyl benzene	3.26E-09	6.74E-09
Hexane (n-)		
Naphthalene	1.83E-08	3.79E-08
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**3.24E-07**	**6.66E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

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Attachment D

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		6.91E-06	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		6.60E-08	Pass	Pass
Developmental - DEV	6.02E-04	2.07E-03	Pass	Pass
Endocrine system - END		6.84E-06	Pass	Pass
Eye	3.48E-05		Pass	Pass
Hematopoietic system - HEM	5.88E-04	1.82E-03	Pass	Pass
Immune system - IMM	5.88E-04		Pass	Pass
Kidney - KID		6.91E-06	Pass	Pass
Nervous system - NS	1.39E-05	2.36E-03	Pass	Pass
Reproductive system - REP	6.02E-04		Pass	Pass
Respiratory system - RES	3.48E-05	9.58E-04	Pass	Pass
Skin			Pass	Pass

A/N: T2640 **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			9.74E-05		9.74E-05	9.74E-05		9.74E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				2.64E-09					2.64E-09	
Toluene (methyl benzene)			2.31E-06	2.31E-06			2.31E-06	2.31E-06	2.31E-06	
Xylenes (isomers and mixtures)				3.46E-06					3.46E-06	
Total			9.97E-05	5.77E-06	9.74E-05	9.74E-05	2.31E-06	9.97E-05	5.77E-06	

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Attachment D

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			5.88E-04		5.88E-04	5.88E-04		5.88E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				1.60E-08					1.60E-08	
Toluene (methyl benzene)			1.39E-05	1.39E-05			1.39E-05	1.39E-05	1.39E-05	
Xylenes (isomers and mixtures)				2.09E-05					2.09E-05	
Total			6.02E-04	3.48E-05	5.88E-04	5.88E-04	1.39E-05	6.02E-04	3.48E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.72E-04			1.72E-04			1.72E-04			
Chrysene													
Cresol mixtures										6.18E-09			
Ethyl benzene	6.46E-07			6.46E-07	6.46E-07				6.46E-07				
Hexane (n-)										1.90E-05			
Naphthalene												5.85E-05	
Phenol	6.23E-09		6.23E-09						6.23E-09	6.23E-09			
Toluene (methyl benzene)				2.31E-05						2.31E-05		2.31E-05	
Xylenes (isomers and mixtures)										8.85E-06		8.85E-06	
Total	6.52E-07		6.23E-09	1.95E-04	6.46E-07		1.72E-04		6.52E-07	2.23E-04		9.04E-05	

A/N: T2640 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.82E-03			1.82E-03			1.82E-03			
Chrysene													
Cresol mixtures										6.54E-08			
Ethyl benzene	6.84E-06			6.84E-06	6.84E-06				6.84E-06				
Hexane (n-)										2.02E-04			
Naphthalene												6.19E-04	
Phenol	6.60E-08		6.60E-08						6.60E-08	6.60E-08			
Toluene (methyl benzene)				2.45E-04						2.45E-04		2.45E-04	
Xylenes (isomers and mixtures)										9.37E-05		9.37E-05	
Total	6.91E-06		6.60E-08	2.07E-03	6.84E-06		1.82E-03		6.91E-06	2.36E-03		9.58E-04	

D-10

Attachment D

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	T2643
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	48	feet
Area (For Volume Source Only)	3000	ft^2
Distance-Residential	700	meters
Distance-Commercial	125	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
[redacted]e output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0 1	lbs/hr
B1	Benzene (including benzene from gasoline)	2.36E-03	78.11	0.002361449		0.002361449
P15	Chrysene	2.28E-06	228.2928	2.28416E-06		2.28416E-06
C30	Cresol mixtures	1.27E-09	108.14	1.26964E-09		1.26964E-09
E4	Ethyl benzene	2.32E-04	106.16	0.000232303		0.000232303
H8	Hexane (n-)	3.11E-02	86.18	0.031123605		0.031123605
P30	Naphthalene	8.17E-05	128.1732	8.17208E-05		8.17208E-05
P3	Phenol	3.01E-09	94.11	3.00957E-09		3.00957E-09
T3	Toluene (methyl benzene)	1.33E-03	92.13	0.00133255		0.00133255
X1	Xylenes (isomers and mixtures)	9.99E-04	106.2	0.000999018		0.000999018
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TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	T2643
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors table:

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.282	16.48
Commercial	4.8075	180

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

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Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	2.36E-03	2.36E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	2.28E-06	2.28E-06	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	1.27E-09	1.27E-09		1	1	1	1.0000	600	
Ethyl benzene	2.32E-04	2.32E-04	8.70E-03	1	1	1	1	2000	
Hexane (n-)	3.11E-02	3.11E-02		1.0000	1.0000	1	1	7000	
Naphthalene	8.17E-05	8.17E-05	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	3.01E-09	3.01E-09		1	1	1	1	200	5800
Toluene (methyl benzene)	1.33E-03	1.33E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	9.99E-04	9.99E-04		1.0000	1.0000	1	1	700	22000

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	2.36E-03	2.36E-03	20.6296184	0.010314809
Chrysene	2.28E-06	2.28E-06	0.01995442	9.97721E-06
Cresol mixtures	1.27E-09	1.27E-09	1.1092E-05	5.5458E-09
Ethyl benzene	2.32E-04	2.32E-04	2.02939875	0.001014699
Hexane (n-)	3.11E-02	3.11E-02	271.895811	0.135947905
Naphthalene	8.17E-05	8.17E-05	0.7139126	0.000356956
Phenol	3.01E-09	3.01E-09	2.6292E-05	1.31458E-08
Toluene (methyl benzene)	1.33E-03	1.33E-03	11.6411581	0.005820579
Xylenes (isomers and mixtures)	9.99E-04	9.99E-04	8.72742194	0.004363711
Total	3.61E-02	3.61E-02	3.16E+02	1.58E-01

A/N: T2643 **Application deemed complete date:** 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	8.35E-08	2.78E-07
Chrysene	9.37E-10	1.53E-09
Cresol mixtures		
Ethyl benzene	7.15E-10	2.38E-09
Hexane (n-)		
Naphthalene	3.47E-09	1.15E-08
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**8.86E-08**	**2.93E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

D-15

Attachment D

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		2.42E-06	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		3.13E-10	Pass	Pass
Developmental - DEV	3.33E-04	9.13E-04	Pass	Pass
Endocrine system - END		2.41E-06	Pass	Pass
Eye	1.47E-05		Pass	Pass
Hematopoietic system - HEM	3.27E-04	8.18E-04	Pass	Pass
Immune system - IMM	3.27E-04		Pass	Pass
Kidney - KID		2.42E-06	Pass	Pass
Nervous system - NS	6.48E-06	1.03E-03	Pass	Pass
Reproductive system - REP	3.33E-04		Pass	Pass
Respiratory system - RES	1.47E-05	3.11E-04	Pass	Pass
Skin			Pass	Pass

A/N: T2643 **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute

HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential								
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			2.99E-05		2.99E-05	2.99E-05		2.99E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				8.55E-12					8.55E-12	
Toluene (methyl benzene)			5.94E-07	5.94E-07			5.94E-07	5.94E-07	5.94E-07	
Xylenes (isomers and mixtures)				7.48E-07					7.48E-07	
Total			3.05E-05	1.34E-06	2.99E-05	2.99E-05	5.94E-07	3.05E-05	1.34E-06	

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			3.27E-04		3.27E-04	3.27E-04		3.27E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				9.34E-11					9.34E-11	
Toluene (methyl benzene)			6.48E-06	6.48E-06			6.48E-06	6.48E-06	6.48E-06	
Xylenes (isomers and mixtures)				8.17E-06					8.17E-06	
Total			3.33E-04	1.47E-05	3.27E-04	3.27E-04	6.48E-06	3.33E-04	1.47E-05	

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Attachment D

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				4.80E-05			4.80E-05			4.80E-05			
Chrysene													
Cresol mixtures										2.58E-12			
Ethyl benzene	1.42E-07			1.42E-07	1.42E-07				1.42E-07				
Hexane (n-)										5.42E-06			
Naphthalene												1.11E-05	
Phenol	1.84E-11		1.84E-11						1.84E-11	1.84E-11			
Toluene (methyl benzene)				5.42E-06						5.42E-06		5.42E-06	
Xylenes (isomers and mixtures)										1.74E-06		1.74E-06	
Total	1.42E-07		1.84E-11	5.36E-05	1.42E-07		4.80E-05		1.42E-07	6.06E-05		1.82E-05	

A/N: T2643 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				8.18E-04			8.18E-04			8.18E-04			
Chrysene													
Cresol mixtures										4.40E-11			
Ethyl benzene	2.41E-06			2.41E-06	2.41E-06				2.41E-06				
Hexane (n-)										9.24E-05			
Naphthalene												1.89E-04	
Phenol	3.13E-10		3.13E-10						3.13E-10	3.13E-10			
Toluene (methyl benzene)				9.23E-05						9.23E-05		9.23E-05	
Xylenes (isomers and mixtures)										2.97E-05		2.97E-05	
Total	2.42E-06		3.13E-10	9.13E-04	2.41E-06		8.18E-04		2.42E-06	1.03E-03		3.11E-04	

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	R510
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	50	feet
Area (For Volume Source Only)	47742.25	ft^2
Distance-Residential	650	meters
Distance-Commercial	50	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
[redacted] output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0 1	lbs/hr
B1	Benzene (including benzene from gasoline)	1.07E-03	78.11	0.001071918		0.001071918
P15	Chrysene	7.99E-06	228.2928	7.99087E-06		7.99087E-06
C30	Cresol mixtures	2.28E-06	108.14	2.28311E-06		2.28311E-06
E4	Ethyl benzene	5.90E-04	106.16	0.000590183		0.000590183
H8	Hexane (n-)	6.04E-03	86.18	0.006044521		0.006044521
P30	Naphthalene	3.46E-04	128.1732	0.00034589		0.00034589
P3	Phenol	1.14E-06	94.11	1.14155E-06		1.14155E-06
T3	Toluene (methyl benzene)	2.49E-03	92.13	0.002487443		0.002487443
X1	Xylenes (isomers and mixtures)	3.71E-03	106.2	0.003706621		0.003706621
				0		
				0		
[redacted]				0		
				0		
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TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	R510
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors table:

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.302	15.7
Commercial	13.05	213.8

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

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Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	1.07E-03	1.07E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	7.99E-06	7.99E-06	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	2.28E-06	2.28E-06		1	1	1	1.0000	600	
Ethyl benzene	5.90E-04	5.90E-04	8.70E-03	1	1	1	1	2000	
Hexane (n-)	6.04E-03	6.04E-03		1.0000	1.0000	1	1	7000	
Naphthalene	3.46E-04	3.46E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	1.14E-06	1.14E-06		1	1	1	1	200	5800
Toluene (methyl benzene)	2.49E-03	2.49E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	3.71E-03	3.71E-03		1.0000	1.0000	1	1	700	22000

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	1.07E-03	1.07E-03	9.36427397	0.004682137
Chrysene	7.99E-06	7.99E-06	0.06980822	3.49041E-05
Cresol mixtures	2.28E-06	2.28E-06	0.01994521	9.9726E-06
Ethyl benzene	5.90E-04	5.90E-04	5.15583562	0.002577918
Hexane (n-)	6.04E-03	6.04E-03	52.8049315	0.026402466
Naphthalene	3.46E-04	3.46E-04	3.02169863	0.001510849
Phenol	1.14E-06	1.14E-06	0.0099726	4.9863E-06
Toluene (methyl benzene)	2.49E-03	2.49E-03	21.7303014	0.010865151
Xylenes (isomers and mixtures)	3.71E-03	3.71E-03	32.3810411	0.016190521
Total	1.43E-02	1.43E-02	1.25E+02	6.23E-02

A/N: R510 Application deemed complete date: 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	4.06E-08	3.42E-07
Chrysene	3.51E-09	1.46E-08
Cresol mixtures		
Ethyl benzene	1.94E-09	1.64E-08
Hexane (n-)		
Naphthalene	1.57E-08	1.33E-07
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**6.18E-08**	**5.06E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

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Attachment D

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		1.70E-05	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		3.22E-07	Pass	Pass
Developmental - DEV	1.91E-04	1.49E-03	Pass	Pass
Endocrine system - END		1.67E-05	Pass	Pass
Eye	5.04E-05		Pass	Pass
Hematopoietic system - HEM	1.76E-04	1.01E-03	Pass	Pass
Immune system - IMM	1.76E-04		Pass	Pass
Kidney - KID		1.70E-05	Pass	Pass
Nervous system - NS	1.44E-05	1.82E-03	Pass	Pass
Reproductive system - REP	1.91E-04		Pass	Pass
Respiratory system - RES	5.04E-05	2.94E-03	Pass	Pass
Skin			Pass	Pass

A/N: R510 **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential								
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			1.29E-05		1.29E-05	1.29E-05		1.29E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				3.09E-09					3.09E-09	
Toluene (methyl benzene)			1.06E-06	1.06E-06			1.06E-06	1.06E-06	1.06E-06	
Xylenes (isomers and mixtures)				2.65E-06					2.65E-06	
Total			1.40E-05	3.70E-06	1.29E-05	1.29E-05	1.06E-06	1.40E-05	3.70E-06	

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	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			1.76E-04		1.76E-04	1.76E-04		1.76E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				4.21E-08					4.21E-08	
Toluene (methyl benzene)			1.44E-05	1.44E-05			1.44E-05	1.44E-05	1.44E-05	
Xylenes (isomers and mixtures)				3.60E-05					3.60E-05	
Total			1.91E-04	5.04E-05	1.76E-04	1.76E-04	1.44E-05	1.91E-04	5.04E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				2.33E-05			2.33E-05			2.33E-05			
Chrysene													
Cresol mixtures										4.97E-09			
Ethyl benzene	3.85E-07			3.85E-07	3.85E-07				3.85E-07				
Hexane (n-)										1.13E-06			
Naphthalene												5.02E-05	
Phenol	7.45E-09		7.45E-09						7.45E-09	7.45E-09			
Toluene (methyl benzene)				1.08E-05						1.08E-05		1.08E-05	
Xylenes (isomers and mixtures)										6.92E-06		6.92E-06	
Total	3.93E-07		7.45E-09	3.45E-05	3.85E-07		2.33E-05		3.93E-07	4.22E-05		6.79E-05	

6b. Hazard Index Chronic (cont.)

A/N: R510 **Application deemed complete date:** 09/10/10

	HIC - Commercial											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.01E-03			1.01E-03			1.01E-03			
Chrysene													
Cresol mixtures										2.15E-07			
Ethyl benzene	1.67E-05			1.67E-05	1.67E-05				1.67E-05				
Hexane (n-)										4.87E-05			
Naphthalene												2.17E-03	
Phenol	3.22E-07		3.22E-07						3.22E-07	3.22E-07			
Toluene (methyl benzene)				4.68E-04						4.68E-04		4.68E-04	
Xylenes (isomers and mixtures)										2.99E-04		2.99E-04	
Total	1.70E-05		3.22E-07	1.49E-03	1.67E-05		1.01E-03		1.70E-05	1.82E-03		2.94E-03	

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Attachment D

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	R511
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	50	feet
Area (For Volume Source Only)	47742.25	ft^2
Distance-Residential	550	meters
Distance-Commercial	50	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
e output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
B1	Benzene (including benzene from gasoline)	1.07E-03	78.11	0.001071918		0.001071918
P15	Chrysene	7.99E-06	228.2928	7.99087E-06		7.99087E-06
C30	Cresol mixtures	2.28E-06	108.14	2.28311E-06		2.28311E-06
E4	Ethyl benzene	5.90E-04	106.16	0.000590183		0.000590183
H8	Hexane (n-)	6.04E-03	86.18	0.006044521		0.006044521
P30	Naphthalene	3.46E-04	128.1732	0.00034589		0.00034589
P3	Phenol	1.14E-06	94.11	1.14155E-06		1.14155E-06
T3	Toluene (methyl benzene)	2.49E-03	92.13	0.002487443		0.002487443
X1	Xylenes (isomers and mixtures)	3.71E-03	106.2	0.003706621		0.003706621
				0		
				0		
				0	

TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	R511
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors table:

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.354	18.1
Commercial	13.05	213.8

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

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Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	1.07E-03	1.07E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	7.99E-06	7.99E-06	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	2.28E-06	2.28E-06		1	1	1	1.0000	600	
Ethyl benzene	5.90E-04	5.90E-04	8.70E-03	1	1	1	1	2000	
Hexane (n-)	6.04E-03	6.04E-03		1.0000	1.0000	1	1	7000	
Naphthalene	3.46E-04	3.46E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	1.14E-06	1.14E-06		1	1	1	1	200	5800
Toluene (methyl benzene)	2.49E-03	2.49E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	3.71E-03	3.71E-03		1.0000	1.0000	1	1	700	22000

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	1.07E-03	1.07E-03	9.36427397	0.004682137
Chrysene	7.99E-06	7.99E-06	0.06980822	3.49041E-05
Cresol mixtures	2.28E-06	2.28E-06	0.01994521	9.9726E-06
Ethyl benzene	5.90E-04	5.90E-04	5.15583562	0.002577918
Hexane (n-)	6.04E-03	6.04E-03	52.8049315	0.026402466
Naphthalene	3.46E-04	3.46E-04	3.02169863	0.001510849
Phenol	1.14E-06	1.14E-06	0.0099726	4.9863E-06
Toluene (methyl benzene)	2.49E-03	2.49E-03	21.7303014	0.010865151
Xylenes (isomers and mixtures)	3.71E-03	3.71E-03	32.3810411	0.016190521

A/N: R511 **Application deemed complete date:** 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	4.76E-08	3.42E-07
Chrysene	4.12E-09	1.46E-08
Cresol mixtures		
Ethyl benzene	2.28E-09	1.64E-08
Hexane (n-)		
Naphthalene	1.84E-08	1.33E-07
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**7.24E-08**	**5.06E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	
Cancer Burden:	

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		1.70E-05	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		3.22E-07	Pass	Pass
Developmental - DEV	1.91E-04	1.49E-03	Pass	Pass
Endocrine system - END		1.67E-05	Pass	Pass
Eye	5.04E-05		Pass	Pass
Hematopoietic system - HEM	1.76E-04	1.01E-03	Pass	Pass
Immune system - IMM	1.76E-04		Pass	Pass
Kidney - KID		1.70E-05	Pass	Pass
Nervous system - NS	1.44E-05	1.82E-03	Pass	Pass
Reproductive system - REP	1.91E-04		Pass	Pass
Respiratory system - RES	5.04E-05	2.94E-03	Pass	Pass
Skin			Pass	Pass

A/N: R511 Application deemed complete date: 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential								
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			1.49E-05		1.49E-05	1.49E-05		1.49E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				3.56E-09					3.56E-09	
Toluene (methyl benzene)			1.22E-06	1.22E-06			1.22E-06	1.22E-06	1.22E-06	
Xylenes (isomers and mixtures)				3.05E-06					3.05E-06	
Total			1.61E-05	4.27E-06	1.49E-05	1.49E-05	1.22E-06	1.61E-05	4.27E-06	

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Attachment D

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			1.76E-04		1.76E-04	1.76E-04		1.76E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)								-		
Naphthalene										
Phenol				4.21E-08					4.21E-08	
Toluene (methyl benzene)			1.44E-05	1.44E-05			1.44E-05	1.44E-05	1.44E-05	
Xylenes (isomers and mixtures)				3.60E-05					3.60E-05	
Total			1.91E-04	5.04E-05	1.76E-04	1.76E-04	1.44E-05	1.91E-04	5.04E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				2.73E-05			2.73E-05			2.73E-05			
Chrysene													
Cresol mixtures										5.82E-09			
Ethyl benzene	4.52E-07			4.52E-07	4.52E-07				4.52E-07				
Hexane (n-)										1.32E-06			
Naphthalene												5.88E-05	
Phenol	8.74E-09		8.74E-09						8.74E-09	8.74E-09			
Toluene (methyl benzene)				1.27E-05						1.27E-05		1.27E-05	
Xylenes (isomers and mixtures)										8.11E-06		8.11E-06	
Total	4.60E-07		8.74E-09	4.05E-05	4.52E-07		2.73E-05		4.60E-07	4.95E-05		7.96E-05	

A/N: R511 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.01E-03			1.01E-03			1.01E-03			
Chrysene													
Cresol mixtures										2.15E-07			
Ethyl benzene	1.67E-05			1.67E-05	1.67E-05				1.67E-05				
Hexane (n-)										4.87E-05			
Naphthalene												2.17E-03	
Phenol	3.22E-07		3.22E-07						3.22E-07	3.22E-07			
Toluene (methyl benzene)				4.68E-04						4.68E-04		4.68E-04	
Xylenes (isomers and mixtures)										2.99E-04		2.99E-04	
Total	1.70E-05		3.22E-07	1.49E-03	1.67E-05		1.01E-03		1.70E-05	1.82E-03		2.94E-03	

Janice West

From: Matthews, John W (P66) [John.Matthews@p66.com]
Sent: Monday, March 11, 2013 3:01 PM
To: Janice West
Cc: Marshall Waller; Medina, Arquimides J (P66); 'Marcia Baverman'
Subject: RE: AI Request for crude tanks project
Attachments: Existing511.pdf; Existing 510.pdf; Fugitive Components.pdf; [EXTERNAL]RE AI Request for crude tanks project

Proposed Tank 2641 has been removed from this project. The request to cancel application number 544858 was sent on 3/7/13.

Revised Forms 400-E-18 and 400-E-GI will be delivered tomorrow, as we discussed last week.

1. The crude speciation is based on a worst case composite of available assays (see attached e-mail). The highest of each TAC concentration from the assays were used to speciate the liquid composition. Crude characteristics are based on crude with a Reid Vapor Pressure of 11 psia.

2. Based on the revised emission calculations, the proposed TVP limit for tanks 510, 511, 2640, and 2643 is 10.2 psia at [redacted] degrees Fahrenheight. Tank 2641 has been removed from the project, so the emissions remain below the CEQA level of significance as was originally claimed. Monthly throughputs for 510 and 511 remain 1.5 million barrels per month each, and 2640 is 2.5 million barrels per month.

3. The new component lists previously submitted have been reviewed and the corrected lists are attached for Tank 2640 and 2643. Proposed Tank 2641 has been removed from the project. The fugitive counts for 510 and 511 are attached. There are no changes proposed for the 510 and 511 fugitive components.

4. All fugitive components associated with the installation of Tank 2643 are included in the attached table. The crude water draws are compatible with the sour water currently processed in DU-301, and will not affect the design basis of the stripper that was previously reviewed. The total flow will remain below the maximum design flow rate for the stripper of 50,000 GPD. Based on these minor piping changes, no changes to the previously reviewed operating conditions for DU-301 are required, and no permit application has been submitted. In accordance with Permit Condition F25.1 of Section H of the existing Title V permit, any pumps and heat exchangers associated with the installation of the the proposed equipment do not require a permit application.

[redacted]hn W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Thursday, January 10, 2013 1:49 PM
To: Matthews, John W (P66)
Subject: [EXTERNAL]AI Request for crude tanks project

Hi John,

As I mentioned on the phone, I am requesting additional information in support of your crude tanks applications. Please provide the following information:

- Details on the speciation of crude oil (the toxics speciation you used in your TANKS calculations), as well as the origin of this speciation and why you feel it is the worst-case scenario for toxics.

- The true vapor pressure limit you are willing to accept for the operation of these tanks (emissions will be recalculated)
- Fugitive counts for the existing crude tanks (and whether this project will cause any changes—if so, provide pre and post-project counts)
- Information on the impact of the project on the benzene stripper (particularly fugitive counts), and your justification for why an additional application is not needed for that permit unit.

Paul, Tran and I met with Jay yesterday, and after our discussion, Jay instructed me to consider the existing tanks as post-NSR tanks, based on the information in the files, as well as the presence of a throughput limit. I will be re-calculating the baseline emissions using the Tanks program (and the parameters specified in the original permit to operate application), so that the calculation method is the same for pre- and post-project emissions.

Please let me know if you have any comments or questions. I'll wait to proceed until I hear from you.

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Phillips 66 Company
Los Angeles Refinery
Fugitive Emission Components

ID 171109, Section D, Process 10, Tank 511

Component	Control	Service	#
Pumps	Sealless	LL	0
	Mechanical seal	LL	1
	Mechanical seal	HL	0
Compressors		Gas/Vap	0
Valves	Bellows sealed	Gas/Vap/LL	16
	Non-bellows sealed	Gas/Vap	0
	Non-bellows sealed	LL	22
PSVs		Gas/Vap/LL	1
Flanges		Gas/Vap/LL	44
Fittings (excluding flanges)		Gas/Vap/LL	30
Other		Gas/Vap/LL	6
Sewer Drains		All	0

Phillips 66 Company
Los Angeles Refinery
Fugitive Emission Components

ID 171109, Section D, Process 10, Tank 510

Component	Control	Service	#
Pumps	Sealless	LL	0
	Mechanical seal	LL	1
	Mechanical seal	HL	0
Compressors		Gas/Vap	0
Valves	Bellows sealed	Gas/Vap/LL	7
	Non-bellows sealed	Gas/Vap	0
	Non-bellows sealed	LL	25
PSVs		Gas/Vap/LL	1
Flanges		Gas/Vap/LL	43
Fittings (excluding flanges)		Gas/Vap/LL	30
Other		Gas/Vap/LL	6
Sewer Drains		All	0

Attachment B
Emissions Calculations

Phillips 66 Carson Plant
Crude Oil Capacity Project

Component Count

Process Unit: Philips 66 Carson Plant New Crude Tank 2640

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm) Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	190	0.00	0	0
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	14	4.55	0	63.64
		Light Liquid (4)	0	0	83	4.55	0	377.30
		Heavy Liquid (5)	0	0		4.55	0	-
		> 8 inches	0	0			0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	5	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	2	46.83	0	
Compressors		Gas / Vapor	0	0		9.09	-	
Flanges (ANSI 16.5-1988)		All	0	0	258	6.99	-	1,803.47
Connectors		All	0	0	134	2.86	-	383.43
Pressure Relief Valves		All	0	0	6		0	-
Process Drains with P-Trap or Seal Pot		All	0	0	0	9.09	-	
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	7	9.09	-	
Total Emissions		lb/year					-	2,628
		lbs/day					0	7.20

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Attachment B
Emissions Calculations

Phillips 66 Carson Plant
Crude Oil Capacity Project

Component Count

Process Unit: **Philips 66 Carson Plant New Crude Tank 2643**

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm) Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	61	0.00	0	0
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	0	4.55	0	-
		Light Liquid (4)	0	0	16	4.55	0	72.73
		Heavy Liquid (5)	0	0	0	4.55	0	-
		> 8 Inches	0	0	0		0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	0	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	0	46.83	0	
Compressors		Gas / Vapor	0	0	0	9.09	-	
Flanges (ANSI 16.5-1988)		All	0	0	79	6.99	-	552.22
Connectors		All	0	0	20	2.86	-	57.23
Pressure Relief Valves		All	0	0	0		0	-
Process Drains with P-Trap or Seal Pot		All	0	0	0	9.09	-	
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	1	9.09	-	
Total Emissions		lb/year					-	682
		lb/day					0	1.87

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Janice West

From: Marcia Baverman [mbaverman@envaudit.com]
Sent: Tuesday, February 05, 2013 1:58 PM
To: Matthews, John W (P66)
Cc: mchoi@envaudit.com
Subject: [EXTERNAL]RE: AI Request for crude tanks project
Attachments: TANK Speciation.xlsx

John –

Attached is the derivation of the "hybrid" speciation used to calculate the emissions in the EPA Tanks 4.0 model. The hybrid speciation is the highest concentration for each TAC from each of the three crude speciations used in the most recent AB2588 HRA. The hybrid speciation allows for only having to run one scenario to determine the TAC emissions for use in the HRA.

Thanks -

Marcia Baverman
Project Manager
714-632-8521 ext. 237
mbaverman@envaudit.com

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From: Matthews, John W (P66) [mailto:John.Matthews@p66.com]
Sent: Tuesday, January 15, 2013 10:24 AM
To: 'MBaverman@EnvAudit.com'
Subject: FW: AI Request for crude tanks project

As discussed.

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Thursday, January 10, 2013 1:49 PM
To: Matthews, John W (P66)
Subject: [EXTERNAL]AI Request for crude tanks project

Hi John,

As I mentioned on the phone, I am requesting additional information in support of your crude tanks applications Please provide the following information:

- Details on the speciation of crude oil (the toxics speciation you used in your TANKS calculations), as well as the origin of this speciation and why you feel it is the worst-case scenario for toxics.
- The true vapor pressure limit you are willing to accept for the operation of these tanks (emissions will be recalculated)
- Fugitive counts for the existing crude tanks (and whether this project will cause any changes—if so, provide pre and post-project counts)
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Paul, Tran and I met with Jay yesterday, and after our discussion, Jay instructed me to consider the existing tanks as post-NSR tanks, based on the information in the files, as well as the presence of a throughput limit. I will be re-calculating the baseline emissions using the Tanks program (and the parameters specified in the original permit to operate application), so that the calculation method is the same for pre- and post-project emissions.

Please let me know if you have any comments or questions. I'll wait to proceed until I hear from you.

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Phillps 66
Crude Oil Speciation

Chemical	CAS	SJV Crude Wt%	Crude Oils Wt%	Cal Crude Wt%	Crude Hybrid [1] Wt%
Acetaldehyde	75-07-0				0
Ammonia	7664-41-7				0
Anthracene	120-12-7				0
Arsenic	7440-38-2				0
Asbestos (friable)	1332-21-4				0
Benzene	71-43-2	0.03	0.1414124	0.0733333	0.1414124
Benzo(g,h,i)perylene	191-24-2				0
Biphenyl	92-52-4				0
1,3-Butadiene	106-99-0				0
Carbon disulfide	75-15-0				0
Carbonyl sulfide	463-58-1				0
Chromium Compounds	N090				0
Cobalt Compounds	N096	0.0001233		0.00014	0
Copper Compounds	N100	2.333E-05		2.167E-05	0
Cumene	98-82-8		0.002471		0.002471
Cyclohexane	110-82-7	0.1966667	0.62557	0.74	0.74
Diethanolamine	111-42-2				0
Dioxins	N150				0
Ethylbenzene	100-41-4	0.01333	0.1492876	0.0766667	0.1492876
Ethylene	74-85-1				0
Formaldehyde	50-00-0				0
Hydrochloric acid	7647-01-0				0
Hydrogen cyanide	74-90-8				0
Lead Compounds	N420			3.333E-06	0
Manganese Compounds	N450	0.000013		0.0000156	0
Mercury Compounds	N458	1.533E-05		0.000024	0
Methanol	67-56-1				0
Molybdenum trioxide	1313-27-5				0
MTBE	1634-04-4				0
Naphthalene	91-20-3		0.0914786	0.05	0.0914786
n-Hexane	110-54-3	0.2533333		0.8933333	0.8933333
Nickel Compounds	N495	0.0073333		0.0052667	
PACs	N590	0.002	0	0.001	0.002
PAHs (excl naphthalene)	1151	0.002	0	0.001	0.002
Phenanthrene	85-01-8				0
Phenol	108-95-2		0.0002283		0.0002283
Propylene	115-07-1				0
Selenium	7782-49-2				0
Styrene	100-42-5				0
Sulfuric acid	7664-93-9				0
Tetrachloroethylene	127-18-4				0
Toluene	108-88-3	0.0366667	0.5772455	0.27	0.5772455

Trichloroethylene	79-01-6				0
1,2,4-Trimethylbenzene	95-63-6		0.2812269		0.2812269
Vanadium Compounds	N770				0
Xylene (mixed isomers)	1330-20-7	0.026657	0.9441758	0.3633333	0.9441758
Zinc Compounds	N982	0.0001123		9.833E-05	0.0001123
1,1-Dichloro-1-Flouroethane	1717-00-6				0
Acrolein	107-02-8				0
Aluminum	7429-90-5				0
Barium	7440-39-3				0
Benzidine	92-87-5				0
Beryllium	7440-41-7				0
Cadmium Compounds	N078				0
Certain Glycol Ethers	N230				0
Chlorine	7782-50-5				0
Cresol (mixed isomers)	1319-77-3		0.0005707		0.0005707
Cumene hydroperoxide	80-15-9				0
Di(2-ethylhexyl) phthalate	117-81-7				0
Dichlorobenzene (mixed)	25321-22-6				0
Ethylene glycol	107-21-1				0
HCFC-22	75-45-6				0
Hydroquinone	123-31-9				0
Methyl ethyl ketone	78-93-3				0
Methyl isobutyl ketone	108-10-1				0
n-Butyl alcohol	71-36-3				0
Nitrate Compounds	N511				0
Silver Compounds	N740				0
Sodium nitrite	7632-00-0				0
					0
					0
					0
Polycyclic Aromatic Compounds (Speciated)					
1-Nitropyrene	5522-43-0				0
3-Methylcholanthrene	56-49-5				0
5-Methylchrysene	3697-24-3				0
7,12-Dimethylbenzen(a)-anthracene	57-97-6				0
7H-Dibenzo(c,g)carbazole	194-59-2				0
Benzo(a)anthracene	56-55-3				0
Benzo(a)phenanthrene	218-01-9	0.002		0.001	0.002
Benzo(a)pyrene	50-32-8				0
Benzo(b)fluoranthene	205-99-2				0
Benzo(j)fluoranthene	205-82-3				0
Benzo(j,k)fluorene	206-44-0				0
Benzo(k)fluoranthene	207-08-9				0
Benzo(r,s,t)pentaphene	189-55-9				0
Dibenz(a,h)acridine	226-36-8				0
Dibenz(a,j)acridine	224-42-0				0
Dibenzo(a,e)fluoranthene	5385-75-1				0
Dibenzo(a,e)pyrene	192-65-4				0
Dibenzo(a,h)anthracene	53-70-3				0
Dibenzo(a,h)pyrene	189-64-0				0
Dibenzo(a,l)pyrene	191-30-0				0

Indeno(1,2,3-cd)pyrene	193-39-5				0
PACs	N590	0.002	0	0.001	0.002
					0
Polynuclear Aromatic Hydrocarbons (Speciated)					
Benzo(a)pyrene	50-32-8	0	0	0	0
Dibenz(a,h)anthracene	53-70-3	0	0	0	0
Benz(a)anthracene	56-55-3	0	0	0	0
Acenaphthene	83-32-9				0
Phenanthrene	85-01-8	0	0	0	0
Fluorene	86-73-7				0
Naphthalene	91-20-3		0.0914786	0.05	0.0914786
2-Methyl naphthalene	91-57-6				0
Anthracene	120-12-7	0	0	0	0
Pyrene	129-00-0				0
Dibenzo(a,i)pyrene	189-55-9	0	0	0	0
Dibenzo(a,h)pyrene	189-64-0	0	0	0	0
Benzo(g,h,i)perylene	191-24-2	0	0	0	0
Dibenzo(a,l)pyrene	191-30-0	0	0	0	0
Dibenzo(a,e)pyrene	192-65-4	0	0	0	0
Benzo(e)pyrene	192-97-2				0
Indeno(1,2,3-cd)pyrene	193-39-5	0	0	0	0
Perylene	198-55-0				0
Benzo(j)fluoranthene	205-82-3	0	0	0	0
Benzo(b)fluoranthene	205-99-2	0	0	0	0
Fluoranthene	206-44-0	0	0	0	0
Benzo(k)fluoranthene	207-08-9	0	0	0	0
Acenaphthylene	208-96-8				0
Chrysene	218-01-9	0.002	0	0.001	0.002
PAHs (excl Naphthalene)	1151	0.002	0	0.001	0.002

(1) Crude Hybrid is maximum wt% of volatile components. Non-volatile components excluded (metals).

ENGINEERING & COMPLIANCE . . . MEMORANDUM

TO: File	FROM: Janice West	DATE: 1/9/13
REFERENCE: Phillips 66 crude tank project		PERMIT APPL. NO.: 544857-544861
SUBJECT: NSR status of existing crude tanks Tk 510 (D394) and Tk 511 (D395)		

A meeting was held 1/9/13 in Room 3C to discuss recent applications from Phillips 66. Attending: Jay Chen, Tran Vo, Paul Park, and Janice West

After providing background on the proposed project, I reviewed the history of the tank permit units, noting that the original construction PC was issued 4/5/74 (this PC expired and was re-issued 5/14/76). Both of these dates are before the original New Source Review Rules (Rule 213) were adopted by the California Air Resources Board on October 8, 1976.

The first Permit to Operate was not issued until A/N C18850 {M12252}, a modification to upgrade tank 510 (D394) seals for Rule 463 compliance, was issued a Permit to Operate 11/13/80 (then reissued twice on 12/29/82 and again on 1/10/84). Note that Tanks 510 and 511 have parallel histories, and started out as identical tanks, and were modified at the same time in most instances—the Tank 510 history was used for discussion purposes). As part of the engineering evaluation for A/N C18850, it is stated that "an emission reduction will develop and B.A.C.T. will be utilized so Rule 213 will be satisfied." In the same evaluation, written by Dave Schwein, the emission data sheet shows check marks in boxes indicating "rule reduction", "Rule 213 applicable (unit installed or permit to construct issued on or subsequent to 10/8/76)", and "BACT evaluation: Not Made". These seemingly contradictory statements made the NSR status (pre-NSR or post-NSR) of these tanks unclear.

The reason for at least one of the reissuances of A/N C18850 was due to a decision by the Hearing Board, resulting in removal of all permit conditions (a vapor pressure limit and a seal installation requirement). No records of this Hearing Board decision have been located, so the content of the permit appeal are unknown.

All subsequent applications for these permit units involved seal upgrades, administrative changes, or changes of ownership. None of these applications had emission increases that triggered the current requirements for NSR at the time they were issued permits.

In 2002, as part of cleanup prior to issuing the Title V permit, throughput limits were added to the facility permit for tanks D394 and D395. Typically, throughput limits are applied only to post-NSR tanks. There are no records of the facility objecting to these throughput limits, which were based on the throughputs proposed as part of the original new construction of the tanks.

The facility submitted applications for modification to these two existing tanks, and contemporaneous construction of three new tanks, resulting in total emissions from the three new and two existing tanks of 70.78 lb/day. The facility also stated that the post-NSR tanks' potential to emit was 207.4 lb/day (total for both tanks), showing a net emissions reduction for the project.

After some discussion, Jay stated that he felt the tanks should continue to be treated as post-NSR tanks, as mentioned in the evaluation for A/N C18850, and as indicated by the current throughput limits. Tran mentioned that standard practice may have been different at that time, and internal procedures may have called for setting an NSR emissions baseline when modifications were performed. Paul did not agree, and stated that NSR should not have been triggered because the seal upgrade caused an emission reduction, so no NSR review should have been necessary, and they should be considered pre-NSR tanks despite the presumed errors in the evaluation. Jay's final decision was to treat the tanks as post-NSR tanks for emission calculation purposes.

Jay further stated that he had no objections to use of contemporaneous reduction to account for the emissions from new construction of the three new tanks. Tran recommended updating the tank emission calculation using the current version of Tanks 4.0 (but with the same tank parameters), but Jay did not expect that to have a significant impact on the number of offsets required for the project.

Table 3 Emission Reduction Credits Summary (from facility submittal)

Tank No.	**Emissions (lbs/day)**
Post Project Emissions	
Existing Tank 510 Crude Tank	12.5
Existing Tank 511 Crude Tank	12.5
New Tank 2640 Crude Tank	15.89
New Tank 2641 Crude Tank	15.89
New Tank 2643 Water Draw Tank	2.54
Fugitive Emissions	11.46
Total Project Emissions	70.78
NSR Balance for Tanks 510 and 511	207.4
Offsets required	0

Permitting History for Tank 510 (D394)

A/N	Permit #	Facility ID	description	received	Permit issued	Emissions	Conditions
Tank 510 (D394)							
535286	G17717	171109	Change of operator from ConocoPhillips to Phillips 66	3/27/12	6/12/12		(same)
487992	F99603	800362	Administrative change to add "two tank mixers" to device description	8/28/08	11/7/08		(same)
407453	F62413	800362	Administrative change - upgrade primary & secondary seals	10/8/02	8/5/03	no NSR eval	(same)
					7/10/02		C1.17 (throughput <4.5625e6 bbl/yr), H23.4 (NSPS K, R1149 appl)
					1/1/02		1-17 (throughput <4.5625e6 bbl/yr), 22-4 (tvp <11psia), 23-4 (NSPS K, 1149 appl)
325644	F6643	800362	Change of ownership from Unocal to Tosco	3/12/97	6/10/97		(none)
257958	D45670	88892 - Unocal Corp, Union Oil Co of Cal Unit 38	Change of ownership from Shell to Unocal	11/15/91	12/9/91	data taken from previous permit: ROG R1: 212 lb/hr, R2: 111 lb/hr	Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the applciation under which this permit is issued unless otherwise noted below. This equipment shall be properly maintained and kept in good operating condition at all times.

C18850	R-M12252	8458	permit revised to add two mixers Fiche 09521 C14	-	1/10/84		
C18850	R-M12252	8458	Permit revised	-	12/29/82 10/16/78 PC		
C18850	M12252	8458 - Shell Oil Co Unit No. 15	Modification to install secondary seals for R463 complianceavg throughput: 12,500 bbl/d (4,562,500 bbl/yr)Eval states: "An emission reduction will develop and BACT will be utilized to Rule 213 will be satisfied."	-	11/13/80 10/16/78 PC	R1: 212, R2: 111calcs show present: 398.4 lb/d, proposed: 103.7 lb/d (294.7 lb/d reduction in losses)	This tank must not be used for storing organic liquid having a vapor pressure of 569 mm Hg (11 psia) or greater under actual storage conditions.Installation of the approved secondary seal is not to begin until the primary seal has been inspected and approved by the SCAQMD.
Note on 12/27/82 instruction sheet for permit wording and fee data: Delete existing conditions on P/O and reissue P/O. Comments: Special Instr. - As per decision of Hearing Board on Shell delete all conditions on M-12252 and reissue P/O prev conditions: 1. This tank must not be sued for storing organic liquid having a vapor pressure of 559 mm Hg (11 psia) or greater under actual storage conditions. 2. The roof must be kept floating at all times, except when supported on the legs for the purpose of emptying the tank. When the roof is on its legs, the tank must be emptied of organic materials as rapidly as possible. To prevent excessive filling losses, water should be used for refloating the roof.							
C08256		shell	change of operator				
C03789		arco	Resubmittal of PC application because construction was delayed by EIR(description changed to remove "pontoon" from floating roof and add "tube" to seal		5/14/76 PC	emission reduction, exempt. Losses: 212 lb/day (due to different wind speed and avg temp and vapor pressure in calcs)	This tank must not be used for storing petroleum distillate having a vapor pressure of 11 psia or greater under actual storage conditions. This tank must not be operated after July 1, 1977 unless it meets the floating roof closure and roof opening criteria of Rule 463 as amended May 7, 1976,
A79818			New construction of tanks 510-513, 951-953 avg throughput: 12,500 bbl/d (4,562,500 bbl/yr)	~3/12/74	4/5/74 PC	losses: 409 lb/day, 74.6 tons/yr (reduction of 12,240 lb/day relative to fixed roof tank)	This tank must not be used for storing petroleum distillate having a vapor pressure of 11 psia or greater under actual storage conditions.

Janice West

From: Matthews, John W (P66) [John.Matthews@p66.com]
Sent: Tuesday, January 08, 2013 2:16 PM
To: Janice West
Subject: RE: Tanks 510 & 511 & NSR
Attachments: Calcsheet.pdf

Dave Schwien's intent regarding Rule 213 seems to be clearly stated on the second page of the attached calculations from the Tank R-510 permit file (Application # C18850).

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Wednesday, December 19, 2012 6:40 PM
To: Matthews, John W (P66)
Subject: [EXTERNAL]Tanks 510 & 511 & NSR

Hi John,

I recognize that there has possibly been some confusion regarding the NSR status of these tanks. Paul pointed out that the version of Rule 213 that was valid at that time (1978) placed requirements *(BACT and verification that violations of the NAAQS would not be caused)* only on modifications to sources that emit more than 15 lbs/hr or more than 150 lbs/day of organic gases (see excerpt below and attached (outdated) rule). The modification to install a secondary seal was an emission reduction noted as a "rule reduction" (for Rule 463 compliance) in the A/N C-18850 data sheet, and the unit did not emit more than 15 lbs/hr.

It is likely that the notation of Rule 213 applicability was made in error, and was the cause of the Hearing Board action that later removed the vapor pressure limit from the permit. I haven't been able to locate any Hearing Board files, however. Any documentation you can find on the Hearing Board Case (Shell Oil facility ID 8458, sometime between 11/13/80 when the PO was issued and 12/29/82, when the permit was re-issued) may be helpful.

We are planning to have an internal meeting to discuss this situation, but Jay is out of the office until next year. I will also be out of the office until next year starting tomorrow. Hopefully, we will be able to resolve this concern early in January.

Please let me know if you find any additional information that would shed light on the situation.

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

"(b)Best Available Control Technology
(b)(2) Modifications to Existing Stationary Sources:
The Air Pollution Control Officer shall deny a permit to construct for any modification of any existing stationary source if such source after modification will emit more than 15 pounds per hour or more than 150 pounds per day of nitrogen oxides, organic gases, or any air contaminant for which there is a state or national ambient air quality standard (except carbon monoxide, for which the limits are 150 pounds per hour and 1500 pounds per day), unless the applicant demonstrates that the modification of the existing stationary source will be constructed using best available technology, and..."

...
"(c) Air Quality Impact Analysis:
(c)(2) Modifications to Existing Stationary Sources:
The Air Pollution Control Officer shall deny -a permit to construct for any modification of any existing stationary source if the modification will result in a net increase in emissions from the existing source of more than 250 pounds per day of nitrogen oxides, organic gases, or any air contaminant for which there is a national ambient air quality standard (except carbon monoxide, for which the limits are 2500 pounds per day), or which is a precursor of any such air contaminant, unless he determines that the emissions from the modified source will not cause a violation of the national ambient air quality standard for that same contaminant, (or in the case of a precursor, for that contaminant to which the precursor contributes)."
--SCAQMD Rule 213 (Adopted 10/8/76) — note that this rule was amended 4/6/79 and rescinded 6/28/90)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

PAGE 2 | PAGE 1

ENGINEERING DIVISION
APPLICATION PROCESSING AND CALCULATIONS
P/C

APPL. NO. SEE BELOW | DATE 9/10/78
PROCESSED BY DES | CHECKED BY

COMPANY: SHELL OIL COMPANY
1622 EAST SEPULVEDA BLVD., CARSON CA 90749

EQUIPMENT DESCRIPTION:

APPLICATION C-18847:
ALTERATION OF TANK NO. R-513 AS DESCRIBED BY PREVIOUS APPL'N ~~RECEIPT~~ C-08257 BY THE ADDITION OF A SECONDARY SEAL.

APPLICATION C-18848:
ALTERATION OF TANK NO. R-512 AS DESCRIBED BY PREVIOUS APPL'N ~~RECEIPT~~ C-08254 BY THE ADDITION OF A SECONDARY SEAL.

APPLICATION C-18849:
ALTERATION OF TANK NO. R-511 AS DESCRIBED BY PREVIOUS APPL'N ~~RECEIPT~~ C-08255 BY THE ADDITION OF A SECONDARY SEAL.

APPLICATION C-18850:
ALTERATION OF TANK NO. R-510 AS DESCRIBED BY PREVIOUS APPL'N ~~RECEIPT~~ C-08256 BY THE ADDITION OF A SECONDARY SEAL.

BACKGROUND:

THE TANKS LISTED ABOVE ARE OWNED BY ARCO AND LEASED FOR OPERATION FROM ARCO BY SHELL. BOTH COMPANIES HAD SUBMITTED APPLICATIONS FOR THEIR OPERATIONS:

OLD TANK NO.	OLD ARCO APPL'N NO.	OLD SHELL APPL'N NO	NEW TANK NO.	SHELL TYPE ROOF TYPE	TYPE PRIMARY SEAL	CONTENTS
510	C-03789	C-08256	R-510	WELDED ~~PONTOON~~	TUBE	CRUDE
511	C-03790	C-08255	R-511	"	"	"
512	C-03791	C-08254	R-512	"	"	"
513	C-03792	C-08257	R-513	"	"	"

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING DIVISION
APPLICATION PROCESSING AND CALCULATIONS

PAGE 2	PAGE 2
APPL. NO. See P. 1	DATE 7/10/78
PROCESSED BY DES	CHECKED BY

CALCULATIONS:

SEE ATTACHED CALCULATION SHEET. AN EMISSION REDUCTION WILL DEVELOP AND B.A.C.T. WILL BE UTILIZED SO RULE 213 WILL BE SATISFIED. THE SPECIFIC SECONDARY SEAL TO BE USED IS CALLED THE "WEATHERGUARD SEAL" AND WILL BE PROVIDED BY REPUBLIC FABRICATORS. THIS IS AN SCAQMD APPROVED SEAL.

RECOMMENDATIONS:

ISSUE CONDITIONAL P/C's.

Janice West

From: Janice West
Sent: Wednesday, December 19, 2012 2:51 PM
To: 'john.matthews@p66.com'
Subject: Tanks 510 and 511

Hi John,

I recently began my review of the Tank applications you submitted in November. Based on my more extensive review of the permitting history of Tanks 510 and 511, it appears that some adjustments are needed to your emission calculations.

The New Source Review Rule (originally Rule 213) was first adopted by the AQMD on October 8, 1976. The original permits to construct for the new construction of four crude tanks (Tanks 510, 511, 512, and 513) were issued April 5, 1974, then reissued (after a construction delay caused by waiting for an EIR) on 5/14/76. None of the modifications made since appear to have involved an emission increase (most were administrative revisions, change of ownership or tank seal upgrades). Therefore it appears that these tanks were never subject to Rule 213 or Regulation XIII, and thus the determination of required offsets and BACT applicability shall be based on the post-modification potential to emit minus the actual emissions (from the previous two-year period) per Rule 1306(d)(2)(B) and not the pre-modification potential to emit.

The District has always calculated emissions associated with permit units, but it appears that the calculations performed for these tanks were not part of any NSR event and have not included any offsets.

I looked into the AER reports for the last 10+ years, and it appears that you have typically reported less than 5 lb/day for each tank. The throughputs were close to the annual limit (some even appear to have exceeded the limit), but the primary difference appears to be the use of 2.33 for the vapor pressure in your emission calculations. If this is incorrect, you may wish to amend your AER reports. I will also need your 2012 actual emissions for calculating the actual emissions during the two-year period immediately preceding the date of permit application (11/27/12) [see 1306(c)(1) via 1306(d)(2)(B)]. Since you have proposed that the post-modification PTE will be 12.5 (each), this may ultimately represent a nearly 8 lb/day increase per existing tank, and does not mitigate increases from the new tanks.

Please let me know your comments,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Tank 510

Form B6	Total Loss (lbs/yr)	Loss (lb/day)	True Vapor Pressure	Throughput (1000 gal)	Throughput (bbl)
AER 2011	1643	4.56	2.33	192820	4,590,943
AER 2010	1515	4.21	2.33	165961	3,951,459
AER 2009	not available				
AER 2008	1540	4.28	2.33	171111	4,074,078
AER 06-07	1643	4.56	2.33	192930	**4,593,565**
AER 05-06	1715	4.76	2.33	207974	4,951,768
AER 04-05	1415	3.93	2.33	144840	3,448,566

AER 03-04	1510	4.19	2.33	222212	5,290,760
AER 02-03	507	1.41	2.33	77227	1,838,727
AER 01-02	1423	3.95	3.62	167799	3,995,221
AER 00-01	1400	3.89	1.70	134500	3,202,387
			annual throughput limit (bbl):		*4,562,000*

Tank 511

Form B6	Total Loss (lbs/yr)	Loss (lb/day)	True Vapor Pressure	Throughput (1000 gal)	Throughput (bbl)
AER 2011	1660	4.61	2.33	196266	4,672,991
AER 2010	1618	4.49	2.33	187361	4,460,979
AER 2009	not available				
AER 2008	1375	3.82	2.33	136236	3,243,713
AER 06-07	1600	4.44	2.33	183545	4,370,125
AER 05-06	1558	4.33	2.33	174687	4,159,211
AER 04-05	1484	4.12	2.33	159156	3,789,420
AER 03-04	1453	4.04	2.33	205836	4,900,852
AER 02-03	1509	4.19	2.33	170313	4,055,061
AER 01-02	2087	5.80	3.62	192693	4,587,929
AER 00-01	7346	20.41	4.00	134331	3,198,347
			annual throughput limit (bbl):		*4,562,000*

HISTORY of Tank 510 (note that Tank 511 is similar)

A/N	Permit #	Facility ID	description	received	Permit issued	Conditions
TANK 510 (D394)						
535286	G17717	171109	Change of operator from ConocoPhillips to Phillips 66	3/27/12	6/12/12	(same)
487992	F99603	800362	Administrative change to add "two tank mixers" to device description	8/28/08	11/7/08	(same)
407453	F62413	800362	Administrative change - upgrade primary & secondary seals	10/8/02	8/5/03	(same)
					7/10/02	C1.17 (throughput <4.5625e6 bbl/yr), H23.4 (NSPS K, R1149 appl)
					1/1/02	1-17 (throughput <4.5625e6 bbl/yr), 22-4 (tvp <11psia), 23-4 (NSPS K, 1149 appl)
325644	F6643	800362	Change of ownership from Unocal to Tosco	3/12/97	6/10/97	(none)
257958	D45670	88892 - Unocal Corp, Union Oil Co of Cal Unit 38	Change of ownership from Shell to Unocal	11/15/91	12/9/91	Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below. This equipment shall be properly maintained and kept in good operating condition at

						all times.
C18850	R-M12252	8458	permit revised to add two mixers	-	1/10/84	(none)
C18850	R-M12252	8458	Permit revised to remove conditions per Hearing Board	-	12/29/82	(none)
C18850	M12252	8458 - Shell Oil Co Unit No. 15	Modification to install secondary seals for R463 compliance		11/13/80 10/16/78 PC	This tank must not be used for storing organic liquid having a vapor pressure of 569 mm Hg (11 psia) or greater under actual storage conditions. Installation of the approved secondary seal is not to begin until the primary seal has been inspected and approved by the SCAQMD.
C08256		Shell	change of operator (Shell as lessee operator of tanks)	10/14/76		
C03789		Arco	Resubmittal of PC application because construction was delayed by EIR and City of Carson special use permit.	3/15/76	5/14/76 PC	This tank must not be used for storing petroleum distillate having a vapor pressure of 11 psia or greater under actual storage conditions. This tank must not be operated after July 1, 1977 unless it meets the floating roof closure and roof opening criteria of Rule 463 as amended May 7, 1976,
A79818		Atlantic Richfield Company	New construction of tanks 510-513, 951-953 avg throughput: 12,500 bbl/d (4,562,500 bbl/yr) Replacing 785,000 bbl fixed roof storage reservoir. Four tanks (510-513) leased to Shell.	3/12/74	4/5/74 PC (expired 4/5/76)	This tank must not be used for storing petroleum distillate having a vapor pressure of 11 psia or greater under actual storage conditions.

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B6 - Permitted Internal/External Floating Roof Tank Calculation Sheet

IMPORT TANK

☑ The Data is Imported from the EPA Tank4 Application

Tank Description:	36.Tank 510 Basrah/ANS/Oriente cru *
Product Code (See Supplemental Inst. Book):	999. Other *
Product Description :	LARC Mixed crude oils *
Tank ID Number:	D394 *
Max. Storage Capacity, C, (1000 gallons):	13440 *
Tank Diameter, D, (ft):	218 *
Annual Throughput, Q, (1000 gallons):	171111.29 *
Vapor Molecular Weight, Mv, (lb/lb mole):	50
Liquid Density, WL:	7.686
Material True Vapor Pressure, Pva:	2.334505
Pressure Function, Fp:	0.0431978
Shell Clinage Factor, Sc (0.006 for crude oil:0.0015 for others):	0.0015
TAC/ODC:	☐
Permit Device IDs:	D394 *

Product Factor Kc (0.4 for crude oil: 1.0 for other):	1.0
Roof Support Factor, Nc:	0 *
Rim Seal Loss Factor, KR:	3.1433333 *
Roof Fitting Loss Factor, FF:	156.11731 *
Deck Seam Loss Factor, KD:	0 *
Deck Seam Length Factor, SD:	0 *
Calculated Working Loss, Lw , (lbs/yr):	812.71114
Calculated Rim Seal Loss, LR, (lbs/yr):	592.02390
Calculated Deck Fitting Loss, LF, (lbs/yr):	134.87870
Calculated Deck Seam Loss, LD, (lbs/yr):	0
Total Excess Emission From Upsets, LX, (lbs/yr):	0 *
Calculated Total Loss, LT (lbs/yr)(Lw+LR+LF+LD+LX)	1539.6137

* Required Fields

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Do not include comma in numeric fields.

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– Started

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B6 - Permitted Internal/External Floating Roof Tank Calculation Sheet

IMPORT TANK

☑ The Data is Imported from the EPA Tank4 Application

Tank Description:	37.Tank 511 Maya/Eocene crude *	Product Factor Kc (0.4 for crude oil: 1.0 for other):	1.0
Product Code (See Supplemental Inst. Book):	999. Other *		
Product Description :	LARC Mixed crude oils *		
Tank ID Number:	D395 *	Roof Support Factor, Nc:	0 *
Max. Storage Capacity, C, (1000 gallons):	13440 *	Rim Seal Loss Factor, KR:	3.1433333 *
Tank Diameter, D, (ft):	218 *	Roof Fitting Loss Factor, FF:	157.49171 *
Annual Throughput, Q, (1000 gallons):	136235.95 *	Deck Seam Loss Factor, KD:	0 *
Vapor Molecular Weight, Mv, (lb/lb mole):	50	Deck Seam Length Factor, SD:	0 *
Liquid Density, WL:	7.686	Calculated Working Loss, Lw , (lbs/yr):	647.06705
Material True Vapor Pressure, Pva:	2.334505	Calculated Rim Seal Loss, LR, (lbs/yr):	592.02390
Pressure Function, FP:	0.0431978	Calculated Deck Fitting Loss, LF, (lbs/yr):	136.06612
Shell Clinage Factor, Sc (0.006 for crude oil:0.0015 for others):	0.0015	Calculated Deck Seam Loss, LD, (lbs/yr):	0
TAC/ODC:	☐	Total Excess Emission From Upsets, Lx, (lbs/yr):	0 *
Permit Device IDs:	D395 *	Calculated Total Loss, LT (lbs/yr)(Lw+LR+LF+LD+Lx)	1375.1570

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* Required Fields

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Summary
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B6 - Permitted Internal/External Floating Roof Tank Calculation Sheet

IMPORT TANK

☑ The Data is Imported from the EPA Tank4 Application

Tank Description:	41.Tank 510 Basrah/ANS/Oriente cru *		
Product Code (See Supplemental Inst. Book):	999. Other *		
Product Description :	LARC MIXED CRUDE OILS *	Product Factor Kc (0.4 for crude oil: 1.0 for other):	1.0
Tank ID Number:	D394 *	Roof Support Factor, Nc:	0 *
Max. Storage Capacity, C, (1000 gallons):	13440 *	Rim Seal Loss Factor, KR:	3.1433333 *
Tank Diameter, D, (ft):	218 *	Roof Fitting Loss Factor, FF:	156.11731 *
Annual Throughput, Q, (1000 gallons):	165961.29 *	Deck Seam Loss Factor, KD:	0 *
Vapor Molecular Weight, Mv, (lb/lb mole):	50	Deck Seam Length Factor, SD:	0 *
Liquid Density, WL:	7.686	Calculated Working Loss, Lw , (lbs/yr):	788.25069
Material True Vapor Pressure, PVA:	2.334505	Calculated Rim Seal Loss, LR, (lbs/yr):	592.02390
Pressure Function, FP:	0.0431978	Calculated Deck Fitting Loss, LF, (lbs/yr):	134.87870
Shell Clinage Factor, Sc (0.006 for crude oil:0.0015 for others):	0.0015	Calculated Deck Seam Loss, LD, (lbs/yr):	0
TAC/ODC: ☐		Total Excess Emission From Upsets, Lx, (lbs/yr):	0 *
Permit Device IDs:	D394 *	Calculated Total Loss, LT (lbs/yr)(Lw+LR+LF+LD+Lx)	1515.1532

UPDATE RECORD CANCEL

* Required Fields

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TAC Forms
- TAC
- TACS

Summary
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B6 - Permitted Internal/External Floating Roof Tank Calculation Sheet

IMPORT TANK

☑ The Data is Imported from the EPA Tank4 Application

Tank Description:	42.Tank 511 Maya/Eocene crude *
Product Code (See Supplemental Inst. Book):	999. Other *
Product Description :	LARC MIXED CRUDE OILS *
Tank ID Number:	D395 *
Max. Storage Capacity, C, (1000 gallons):	13440 *
Tank Diameter, D, (ft):	218 *
Annual Throughput, Q, (1000 gallons):	187361.11 *
Vapor Molecular Weight, M_V, (lb/lb mole):	50
Liquid Density, W_L:	7.686
Material True Vapor Pressure, P_{VA}:	2.334505
Pressure Function, F_P:	0.0431978
Shell Clinage Factor, Sc (0.006 for crude oil:0.0015 for others):	0.0015
TAC/ODC:	☐
Permit Device IDs:	D395 *

Product Factor K_C (0.4 for crude oil: 1.0 for other):	1.0
Roof Support Factor, N_C:	0 *
Rim Seal Loss Factor, K_R:	3.1433333 *
Roof Fitting Loss Factor, F_F:	157.49171 *
Deck Seam Loss Factor, K_D:	0 *
Deck Seam Length Factor, S_D:	0 *
Calculated Working Loss, L_W , (lbs/yr):	889.89135
Calculated Rim Seal Loss, L_R, (lbs/yr):	592.02390
Calculated Deck Fitting Loss, L_F, (lbs/yr):	136.06612
Calculated Deck Seam Loss, L_D, (lbs/yr):	0
Total Excess Emission From Upsets, L_X, (lbs/yr):	0 *
Calculated Total Loss, L_T (lbs/yr)(L_W+L_R+L_F+L_D+L_X)	1617.9813

* Required Fields

Do not include comma in numeric fields.

UPDATE RECORD CANCEL

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B Forms
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R Forms
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TAC Forms
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B6 - Permitted Internal/External Floating Roof Tank Calculation Sheet

IMPORT TANK

☑ The Data is Imported from the EPA Tank4 Application

Tank Description:	14.Tank 510 *
Product Code (See Supplemental Inst. Book):	999. Other *
Product Description :	LARC MIXED CRUDE OILS *
Tank ID Number:	D394 *
Max. Storage Capacity, C, (1000 gallons):	13440 *
Tank Diameter, D, (ft):	218 *
Annual Throughput, Q, (1000 gallons):	192819.60 *
Vapor Molecular Weight, M_V, (lb/lb mole):	50
Liquid Density, W_L:	7.686
Material True Vapor Pressure, P_{VA}:	2.334505
Pressure Function, F_P:	0.0431978
Shell Clinage Factor, Sc (0.006 for crude oil:0.0015 for others):	0.0015
TAC/ODC:	☐
Permit Device IDs:	D394 *

Product Factor K_C (0.4 for crude oil: 1.0 for other):	1.0
Roof Support Factor, N_C:	0 *
Rim Seal Loss Factor, K_R:	3.1433333 *
Roof Fitting Loss Factor, F_F:	156.11731 *
Deck Seam Loss Factor, K_D:	0 *
Deck Seam Length Factor, S_D:	0 *
Calculated Working Loss, L_W , (lbs/yr):	915.81704
Calculated Rim Seal Loss, L_R, (lbs/yr):	592.02390
Calculated Deck Fitting Loss, L_F, (lbs/yr):	134.87870
Calculated Deck Seam Loss, L_D, (lbs/yr):	0
Total Excess Emission From Upsets, L_X, (lbs/yr):	0 *
Calculated Total Loss, L_T (lbs/yr)(L_W+L_R+L_F+L_D+L_X)	1642.7196

* Required Fields

UPDATE RECORD CANCEL

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R Forms
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TAC Forms
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Summary
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B6 - Permitted Internal/External Floating Roof Tank Calculation Sheet

IMPORT TANK

☑ The Data is Imported from the EPA Tank4 Application

Tank Description:	15.Tank 511 *	Product Factor Kc (0.4 for crude oil: 1.0 for other):	1.0
Product Code (See Supplemental Inst. Book):	999. Other *	Roof Support Factor, Nc:	0 *
Product Description :	LARC MIXED CRUDE OILS *	Rim Seal Loss Factor, KR:	3.1433333 *
Tank ID Number:	D395 *	Roof Fitting Loss Factor, FF:	157.49171 *
Max. Storage Capacity, C, (1000 gallons):	13440 *	Deck Seam Loss Factor, KD:	0 *
Tank Diameter, D, (ft):	218 *	Deck Seam Length Factor, SD:	0 *
Annual Throughput, Q, (1000 gallons):	196265.61 *	Calculated Working Loss, LW , (lbs/yr):	932.18425
Vapor Molecular Weight, MV, (lb/lb mole):	50	Calculated Rim Seal Loss, LR, (lbs/yr):	592.02390
Liquid Density, WL:	7.686	Calculated Deck Fitting Loss, LF, (lbs/yr):	136.06612
Material True Vapor Pressure, PVA:	2.334505	Calculated Deck Seam Loss, LD, (lbs/yr):	0
Pressure Function, FP:	0.0431978	Total Excess Emission From Upsets, LX, (lbs/yr):	0 *
Shell Clinage Factor, SC (0.006 for crude oil:0.0015 for others):	0.0015	Calculated Total Loss, LT (lbs/yr)(LW+LR+LF+LD+LX)	1660.2742
TAC/ODC:	☐		
Permit Device IDs:	D395 *		

UPDATE RECORD CANCEL

* Required Fields

Do not include comma in numeric fields.

AQMD Form 400-E-GI

Philips 66 – Los Angeles Refinery Carson Plant
Facility ID No. 171109

Permit Application

Supplemental Information Package
Crude Capacity Project Tanks

Sections

1. Company Information
2. Background
3. Project Description
4. Equipment Location and Description
5. Operating Schedule
6. Emission Calculations
7. Evaluation and Rule Review
8. Proposed Permit Conditions
9. Confidentiality

Attachments

A Figures
B Emission Calculations
C Tank R510 NSR Balance
D Rule 1401 Analyses

November 15, 2012

1. COMPANY INFORMATION

Mailing Address
1660 W. Anaheim St.
Wilmington, CA 90744

Site Location
Carson Plant
1520 E. Sepulveda Blvd.
Carson, CA 90745

2. BACKGROUND

The Philips 66 Los Angeles Refinery Carson Plant (LARC) operates a crude supply storage tanks to handle incoming crude supplies from domestic as well as various sources from the Port of Long Beach, Berth 121.

LARC currently has four 320,000 barrel (BBL) receiving tanks (285,000 BBL net working capacity) for crude. These tanks usually store three segregated crude grades at a time, which essentially limits deliveries volumes to Panamax vessels (400,000 BBL capacity). For larger vessels, such as Aframax (720,000 BBL) or Suezmax (1,000,000 BBL), LARC requires two ship calls to unload the full volume of the vessels, resulting in seven to 10 days of demurrage between ship calls. Between ship calls LARC makes room in the receiving tanks to accommodate the second discharge from the larger vessel. LARC needs more tankage and capacity to accommodate the larger vessels so they can discharge their total volume in one call.

3. PROJECT DESCRIPTION

The project will increase the onsite crude storage capacity by installing two new 575,000 BBL (500,000 BBL net working capacity) domed external floating roof crude tanks (Tank 2640 and 2641) and geodesic domes on two of the existing crude tanks (Tank R510 (Device D394) and Tank R511(Device D395)). The project also includes the construction of a new 11,500 BBL (10,000 BBL net working capacity) domed external floating roof water draw tank (Tank 2643).

Currently, the water draw from the existing crude tanks is processed in the sour water stripper which is at times overloaded. The water draw from the existing R510 and R511 tanks and new Tanks 2640 and 2641 will be routed to the new water draw Tank 2643. The new 11,500 BBL water draw tank will allow LARC to treat the water at the Brine Stripper, which has excess capacity. Minor modifications are required to the Brine Stripper, consisting of the installation of new heat exchangers and a steam trim heater to raise the temperature of the water before entering the Brine Stripper.

4. EQUIPMENT LOCATION AND TANK DESCRIPTION

The new tanks and tank modifications will be located at the western boundary of LARC. Table 1 shows the specifications of the existing and proposed tanks. Please refer to the Figures 1, 2, and 3 in Attachments A for locations.

TABLE 1
Tank Specifications

Tank Number	Roof Type	Commodity Type	Working Volume (BBL)	Diameter (ft)	Height (ft)	Dome Roof (ft)
Existing 510	Pontoon	Crude Oil	285,000	218	50	42
Existing 511	Pontoon	Crude Oil	285,000	218	50	42
Modified 510	Domed	Crude Oil RVP 7	285,000	218	50	42
Modified 511	Domed	Crude Oil RVP 7	285,000	218	50	42
New Tank 2640	Domed	Crude Oil RVP 7	500,000	260	64	55.5
New Tank 2641	Domed	Crude Oil RVP 7	500,000	260	64	55.5
New Tank 2643	Domed	Water/Crude	10,000	40	48	8.5

5. OPERATING SCHEDULE

	NORMAL	MAXIMUM
Hours/Day	24	24
Days/Week	7	7
Weeks/Year	52	52

6. EMISSION CALCULATIONS

The calculations of emissions for the new tanks and the modified tanks were based on throughputs of 2,400,000 and 1,500,000 BBL per month, respectively. In the case of the water draw tank which is a batch operation, the equipment is sized much larger than what would be expected to be recovered from the crude oil on a steady state basis. However, emissions were still calculated using the larger equipment rating to allow for maximum turnovers. The Table 2 lists the throughputs and annual turnovers of each tank being permitted.

TABLE 2
Fill and Pump Out Specifications

Tank Number	Fill Type	Throughput (BBL/mo)	Annual Turnovers
Modified Tank 510	Pier "T"	1,500,000	64
Modified Tank 511	Pier "T"	1,500,000	64
New Tank 2640	Pier "T"	2,400,000	58
New Tank 2641	Pier "T"	2,400,000	58
New Tank 2643	Pumped	64,000	77

The emissions for the tanks were calculated with the EPA TANKS 4.0.9d emissions model using a crude speciation for crude oil with a Reid Vapor Pressure of 7 (true vapor pressure 11, see Figure 4). The peak daily emission rate was calculated by taking the maximum monthly value and converting to a daily rate. The new 575,000 BBL tanks will use 4" legs instead of the standard 3" legs. Since there are no established emission factors for non-standard sized legs, emissions were scaled based on the difference in circumference between the 3" legs and 4" legs. The fugitive emissions from components were calculated using the SCAQMD correlation equations. The emission calculations can be found in Attachment B.

7. EVALUATION AND RULE REVIEW

The proposed Project is designed to comply with the standards contained in the applicable State and Federal Rules and Regulations. The following provides a brief summary of the applicable regulations.

STATE REGULATIONS

Rule 301 – Permit Fees

Per the requirements of SCAQMD Rule 301, the application fee for the tanks is $13,760.24 (Schedule C – Storage Tank, with External Floating Roof). Expedited permit processing has been requested and an additional $6,880.13 will be submitted with the permit application fee. The total application and expedited fee for the permit application is $22,429.49.

Rule 403 – Fugitive Dust

The construction activities of the proposed project are regulated under SCAQMD Rule 403 which include requirements to minimize fugitive dust using best available control measures that include applying water or chemical stabilizers to active construction sites/unpaved roads, covering all haul vehicles, and so forth.

Rule 463 – Organic Liquid Storage

The crude storage tanks are regulated under SCAQMD Rule 463, which includes requirements to minimize fugitive VOC using best available control measures that include tanks construction standards.

Rule 466 – Pumps and Compressors

Rule 466 establishes inspection, tagging, and maintenance requirements for pumps and compressors. Pumps and compressors associated with all tanks will be included in the LARC Rule 1173 compliance program and will, therefore, comply with Rule 466.

Rule 466.1 – Valves and Flanges

Rule 466.1 establishes inspection, tagging, and maintenance requirements for valves and flanges. Valves and flanges associated with all tanks will be included in the LARC Rule 1173 monitoring program and will, therefore, comply with Rule 466.1.

Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants

The LARC currently complies with Rule 1173 and has a monitoring program for leaks. The new tanks will be incorporated into the existing plan.

Rule 1178 – Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities

Rule 1178 establishes tanks standards to control fugitive VOC emissions. The new and modified tanks associated with proposed Project will comply with Rule 1178.

Regulation XIII – New Source Review

The tanks are subject to Regulation XIII and are subject to requirements to provide emission offsets. Tanks R510 and R511 were permitted pursuant to Rule 213 with an NSR for Tank R510 identified as 103.7 lbs/day (See Attachment C). Since Tank R511 is identical to Tank R510, the total NSR balance for the tanks should be 207.4 lbs/day Pursuant to Rule 1304(c)(2) a concurrent emissions reduction can be used in lieu of providing offsets for the new equipment. As shown in Table 3, no additional offsets are required for this project.

TABLE 3
Emission Reduction Credits Summary

Tank No.	Emissions (lbs/day)
Post Project Emissions	
Existing Tank 510 Crude Tank	12.50
Existing Tank 511 Crude Tank	12.50
New Tank 2640 Crude Tank	15.89
New Tank 2641 Crude Tank	15.89
New Tank 2643 Water Draw Tank	2.54
Fugitive Emissions	11.46
Total Project Emissions	70.78
NSR Balance for Tanks 510 and 511	207.4
Offsets Required	0

Rule 1401 – New Source Review for Toxic Air Contaminants

The tanks will store crude oil which contains chemicals listed under SCAQMD Rule 1401 and considered to be toxic air contaminants. The increase in toxic air contaminants is below the Rule 1401 screening thresholds for each of the four tanks. The Rule 1401 screening analyses are included in Attachment D.

Regulation XX - RECLAIM

The facility is subject to RECLAIM, however, the project only generates VOC emissions, which is not a RECLAIM pollutant. Therefore, no RECLAIM emissions are emitted from this project.

Regulation XXX - Title V Permits

The facility is a Title V facility. Permit modification applications are included in this application package to modify the facility Title V permit. The Title V permit modification qualifies as a significant permit revision pursuant to SCAQMD Rule 3000(b)(31)(I).

FEDERAL REGULATIONS

The federal regulations applicable to the new tanks are as follows:

40 CFR 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984

40 CFR 60 Subpart GGGa – Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After November 7, 2006

40 CFR 61 Subpart V – National Emission Standards for Equipment Leaks (Fugitive Emission Sources)
40 CRF 61 subpart FF – National Emission Standards for Benzene Waste Operations
40 CFR 63 Subpart H – National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks
40 CFR 63 Subpart CC – National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries

The federal regulations, while not identical to the state regulations, are similar to state regulations. The new and modified tanks are designed to comply with BACT requirements, the SCAQMD rules and regulations, and federal regulations. Therefore, the new and modified tanks are expected to comply with applicable subparts of the federal regulations.

8. PROPOSED PERMIT CONDITIONS

Below are the proposed permit conditions for throughput and monitoring of the tanks. These conditions should replace condition C1.17 for existing Tanks 510 and 511, and should read:

> *The operator shall limit the throughput to no more than 1,500,000 barrel(s) in any one calendar month.*
>
> *The operator shall calculate the throughput, in barrels, by the following equation:*
>
> *0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.*
>
> *The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.*
>
> *The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.*
>
> *The operator shall keep adequate records to show compliance with the limitations specified in this permit.*

The conditions for new Tanks 2640 and 2641 should read:

> *The operator shall limit the throughput to no more than 2,400,000 barrel(s) in any one calendar month.*

The operator shall calculate the throughput, in barrels, by the following equation:

0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The operator shall keep adequate records to show compliance with the limitations specified in this permit.

The conditions for new Tanks 2643 should read:

The operator shall limit the throughput to no more than 64,000 barrel(s) in any one calendar month.

The operator shall calculate the throughput, in barrels, by the following equation:

0.14 x d x d x l, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The operator shall keep adequate records to show compliance with the limitations specified in this permit.

9. CONFIDENTIALITY

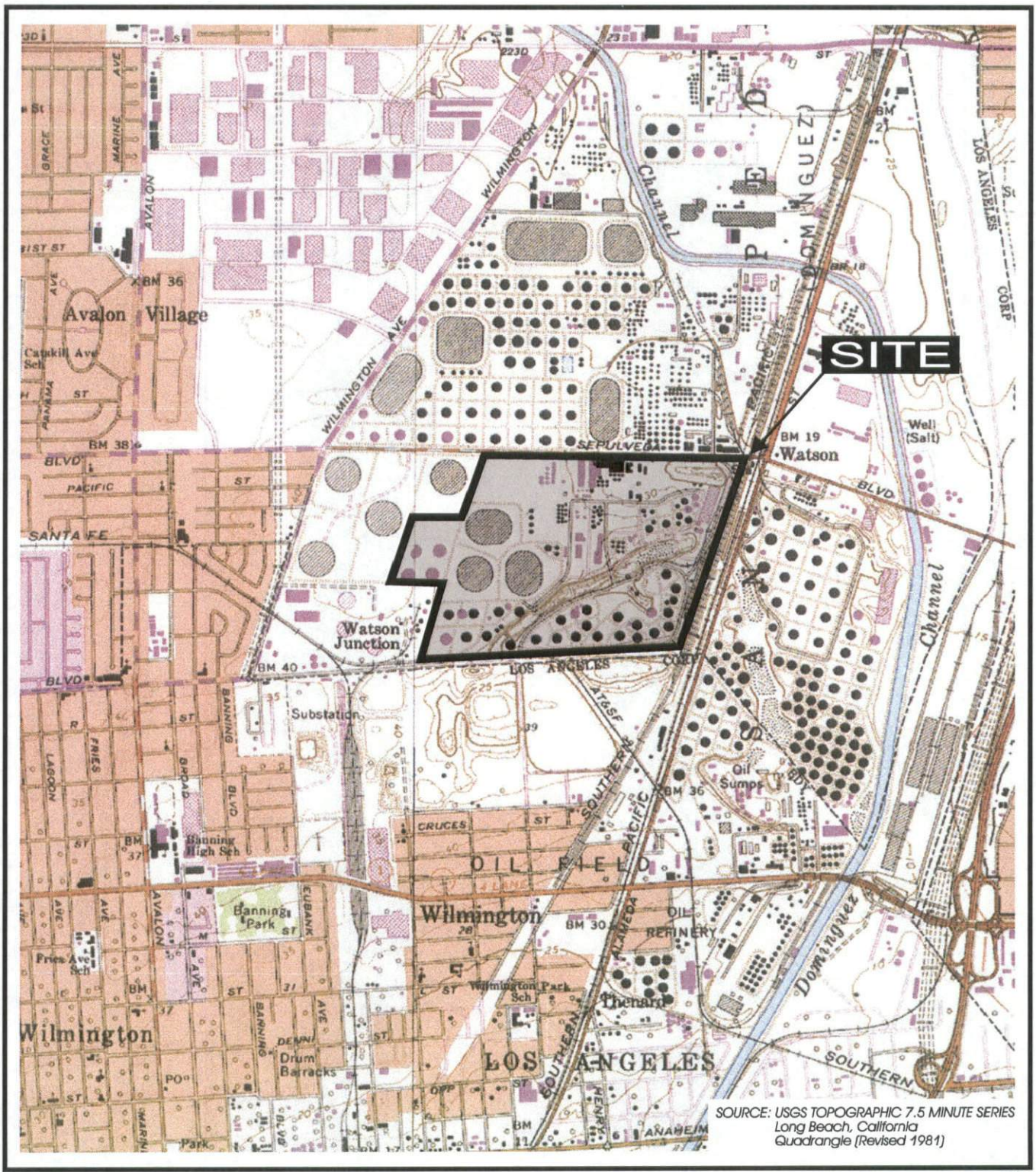
Certain information supplied on the attached sheets concerning process operating conditions, material balances, and process descriptions constitutes confidential and proprietary information under Government Code Section 6254.7. Philips 66 justifies classification of such data as trade secrets because the information contains production data and operating procedures, and therefore would potentially release competitively

sensitive information, which would be of considerable value to competitors. Therefore, we request that all such data be handled in confidence.

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ATTACHMENT A

Figures



Environmental Audit, Inc.

0 2,000'

N

SITE LOCATION MAP
Phillips 66 Los Angeles Refinery
Carson Plant

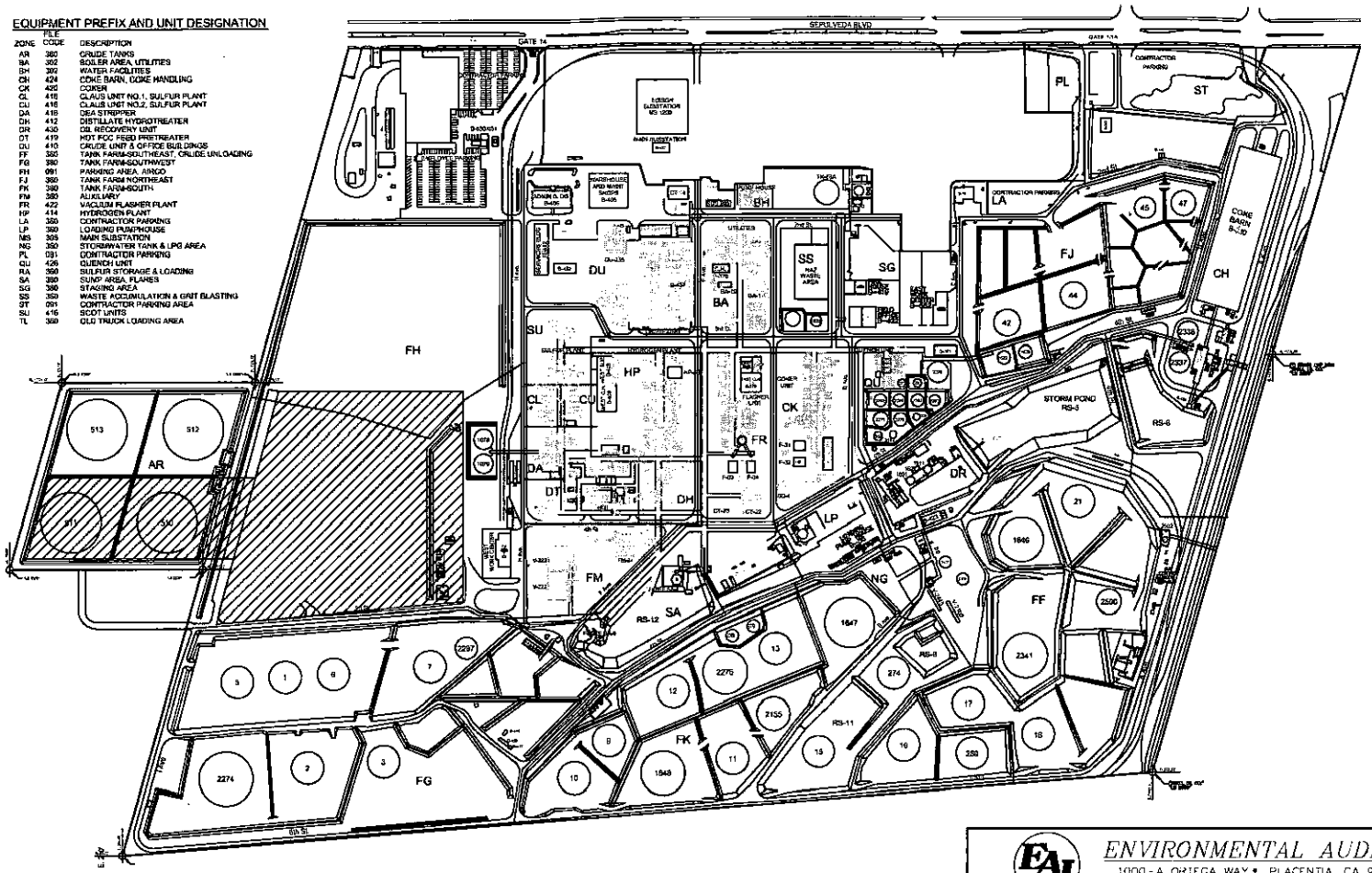
Project No. 2778

Figure 1

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EQUIPMENT PREFIX AND UNIT DESIGNATION

ZONE	FILE CODE	DESCRIPTION
AR	360	CRUDE TANKS
BA	302	BOILER AREA, UTILITIES
BH	302	WATER FACILITIES
CH	424	COKE BARN, COKE HANDLING
CK	420	COKER
CL	416	CLAUS UNIT NO.1, SULFUR PLANT
CU	416	CLAUS UNIT NO.2, SULFUR PLANT
DA	416	DEA STRIPPER
DH	412	DISTILLATE HYDROTREATER
DR	430	DIL RECOVERY UNIT
DT	419	HOT FCC FEED PRETREATER
DU	410	CRUDE UNIT & OFFICE BUILDINGS
FF	350	TANK FARM-SOUTHEAST, CRUDE UNLOADING
FG	360	TANK FARM-SOUTHWEST
FH	091	PARKING AREA, ARCO
FJ	360	TANK FARM NORTHEAST
FK	360	TANK FARM-SOUTH
FM	360	AUXILIARY
FR	422	VACUUM FLASHER PLANT
HP	414	HYDROGEN PLANT
LA	355	CONTRACTOR PARKING
LP	360	LOADING PUMPHOUSE
MS	305	MAIN SUBSTATION
NG	350	STORMWATER TANK & LPG AREA
PL	091	CONTRACTOR PARKING
QU	426	QUENCH UNIT
RA	360	SULFUR STORAGE & LOADING
SA	360	SUMP AREA, FLARES
SG	360	STAGING AREA
SS	350	WASTE ACCUMULATION & GRIT BLASTING
ST	091	CONTRACTOR PARKING AREA
SU	416	SCOT UNITS
TL	360	OLD TRUCK LOADING AREA



LEGEND:

(13) NUMBERS IN AND AROUND OBJECTS REPRESENT INDIVIDUAL TANK NUMBERS

PROPOSED PROJECT AREA

NORTH

0 400'

SCALE

ENVIRONMENTAL AUDIT, INC.
1000-A ORTEGA WAY • PLACENTIA, CA 92870-7125
714/632-8521 • FAX 714/632-6754

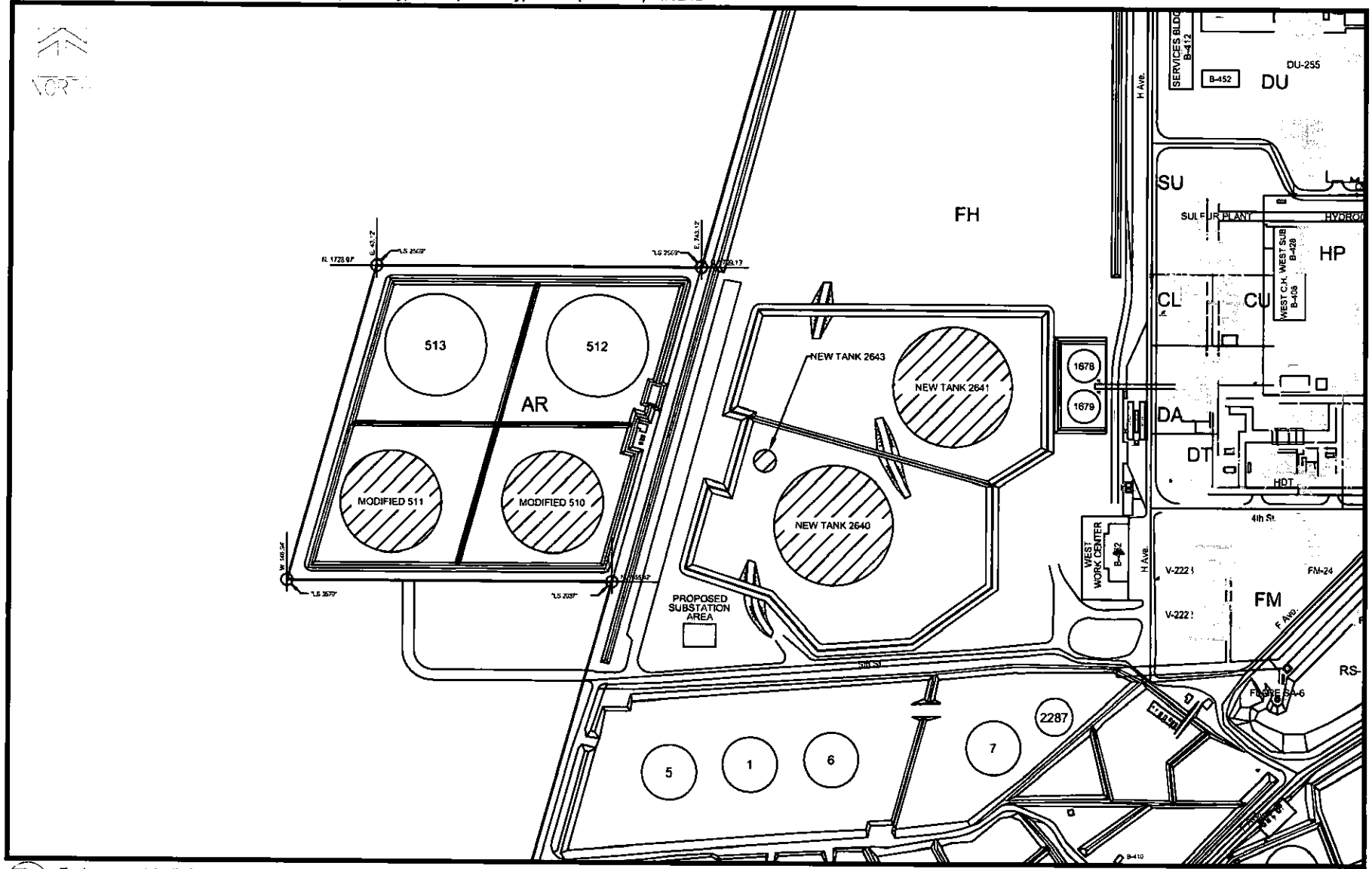
SITE PLAN - PHILLIPS 66 LOS ANGELES REFINERY

DRAWN BY	DATE CREATED
M.B.	11/19/03
CHECKED	LAST REV
DBS	06/11/12
SIZE	
17x11	
FILE NAME	
I:\2778\Site Plan Carson Plant (rev.2)	

CARSON PLANT
1520 E. SEPULVEDA BLVD.
Carson, California

Figure 2

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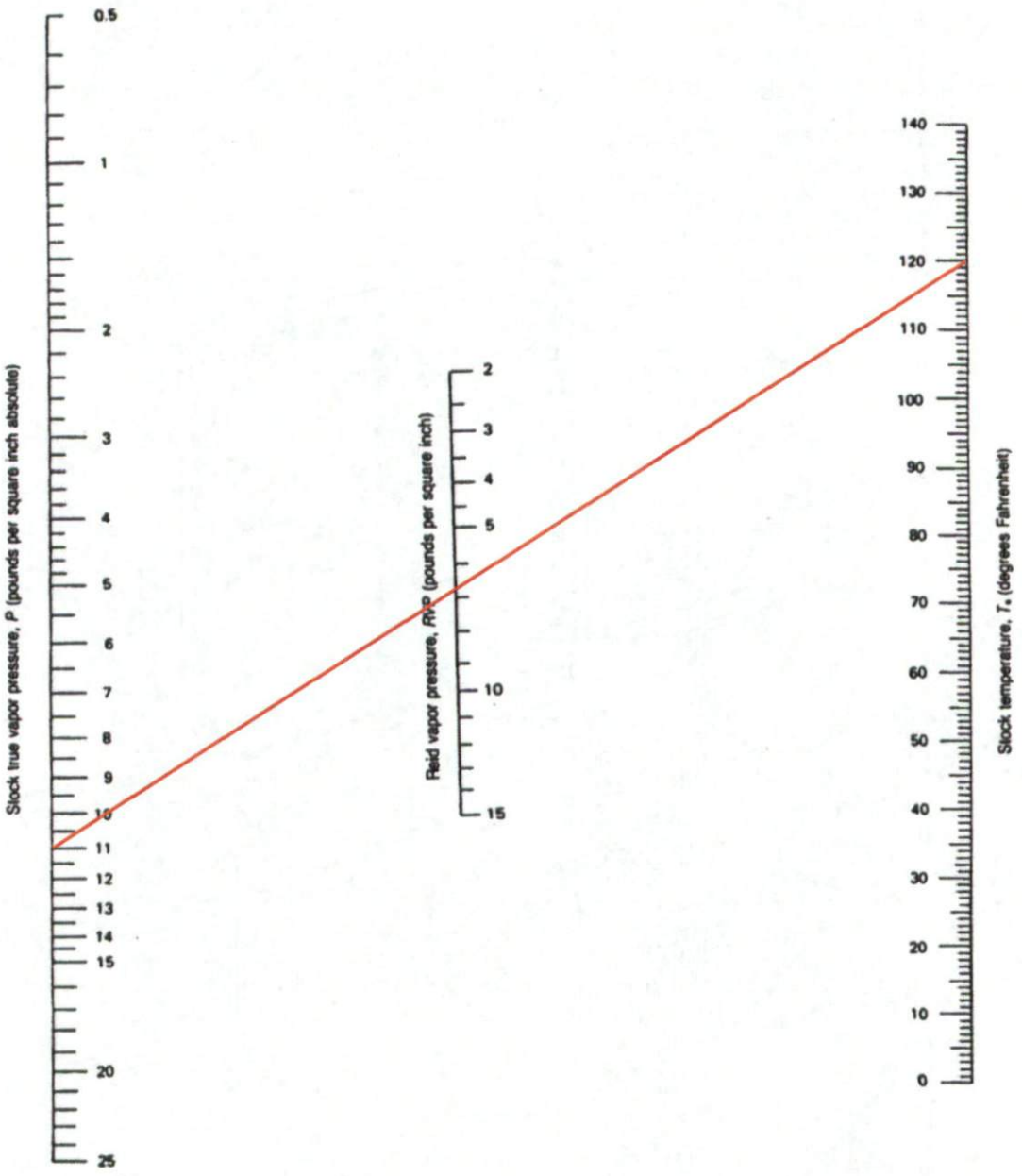


Environmental Audit, Inc.

PROPOSED PROJECT PLAN
Phillips 66 Los Angeles Refinery
Carson Plant

Project No. 2778

Figure 3



True vapor pressure of crude oils with a Reid vapor pressure of 2 to 15 pounds per square inch.

SOURCE: AP42 Figure 7.1-13a (November 2006)

Environmental Audit, Inc.

Nomograph of Crude Oil Vapor Pressure

Project No. 2778

Figure 4

M:\MC\2778\Emission Factors.cdr

ATTACHMENT B

Emission Calculations

Component Count

Process Unit: **Philips 66 Carson Plant New Crude Tank 2640**

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm)		
						Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	148	0.00	0	0
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	7	4.55	0	31.82
		Light Liquid (4)	0	0	32	4.55	0	145.46
		Heavy Liquid (5)	0	0		4.55	0	-
		> 8 inches	0	0			0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	1	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	4	46.83	-	187.30
	Single Mechanical Seals	Heavy Liquid (5)	0	0		46.83	0	
Compressors		Gas / Vapor	0	0		9.09	-	
Flanges (ANSI 16.5-1988)		All	0	0	169	6.99	-	1,181.34
Connectors		All	0	0	90	2.86	-	257.52
Pressure Relief Valves		All	0	0	2		0	-
Process Drains with P-Trap or Seal Pot		All	0	0	3	9.09	-	
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	8	9.09	-	
Total Emissions		lb/year					-	1,803
		lbs/day					0	4.94

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Component Count

Process Unit: **Philips 66 Carson Plant New Crude Tank 2641**

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm)		
						Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	148	0.00	0	0
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	7	4.55	0	31.82
		Light Liquid (4)	0	0	32	4.55	0	145.46
		Heavy Liquid (5)	0	0		4.55	0	-
		> 8 inches	0	0			0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	1	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	4	46.83	-	187.30
	Single Mechanical Seals	Heavy Liquid (5)	0	0		46.83	0	
Compressors		Gas / Vapor	0	0		9.09	-	
Flanges (ANSI 16.5-1988)		All	0	0	169	6.99	-	1,181.34
Connectors		All	0	0	90	2.86	-	257.52
Pressure Relief Valves		All	0	0	2		0	-
Process Drains with P-Trap or Seal Pot		All	0	0	3	9.09	-	
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	8	9.09	-	
Total Emissions		lb/year					-	1,803
		lbs/day					0	4.94

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Component Count

Process Unit: **Philips 66 Carson Plant New Crude Tank 2643**

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm)		
						Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	45	0.00	0	0
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	0	4.55	0	-
		Light Liquid (4)	0	0	10	4.55	0	45.46
		Heavy Liquid (5)	0	0	0	4.55	0	-
		> 8 inches	0	0	0		0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	0	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	0	46.83	0	
Compressors		Gas / Vapor	0	0	0	9.09	-	
Flanges (ANSI 16.5-1988)		All	0	0	72	6.99	-	503.29
Connectors		All	0	0	9	2.86	-	25.75
Pressure Relief Valves		All	0	0	0		0	-
Process Drains with P-Trap or Seal Pot		All	0	0	0	9.09	-	
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	0	9.09	-	
Total Emissions		lb/year					-	575
		lbs/day					0	1.57

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Philips 66 Carson Plant
Crude Tank Fugitive Emissions

		Tank 2640			Tank 2641			Tank 2643		
Chemical	Crude Vapor Wt%	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	2.83	51.09	0.14	0.0058	51.09	0.14	0.0058	16.28	0.04	0.0019
PACs (Chrysene)	0.00	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000
Cresol (mixed isomers)	0.00	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000
Ethylbenzene	0.13	2.26	0.01	0.0003	2.26	0.01	0.0003	0.72	0.00	0.0001
n-Hexane	38.55	695.18	1.90	0.0794	695.18	1.90	0.0794	221.45	0.61	0.0253
Naphthalene	0.00	0.02	0.00	0.0000	0.02	0.00	0.0000	0.00	0.00	0.0000
Phenol	0.00	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000
Toluene	1.01	18.25	0.05	0.0021	18.25	0.05	0.0021	5.81	0.02	0.0007
Cumene	0.00	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000
Xylene (mixed isomers)	0.19	3.49	0.01	0.0004	3.49	0.01	0.0004	1.11	0.00	0.0001
Cyclohexane	19.14	345.26	0.95	0.0394	345.26	0.95	0.0394	109.99	0.30	0.0126
1,2,4-Trimethylbenzene	0.01	0.22	0.00	0.0000	0.22	0.00	0.0000	0.07	0.00	0.0000
Total VOC	100.00	1803.45	4.94	0.2059	1803.45	4.94	0.2059	574.50	1.57	0.0656

Philips 66 Carson Plant
Crude Tank Tank Loss Emissions

	Tank 2640/2641[1]			Tank 2643			Tank R510/R511		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	8.19	0.0224	0.0009	1.30	0.0036	0.0001	6.86	0.0188	0.0008
PACs (Chrysene)	0.09	0.0002	0.0000	0.02	0.0001	0.0000	0.07	0.0002	0.0000
Cresol (mixed isomers)	0.03	0.0001	0.0000	-	-	-	0.02	0.0001	0.0000
Ethylbenzene	6.83	0.0187	0.0008	1.17	0.0032	0.0001	5.12	0.0140	0.0006
n-Hexane	59.22	0.1622	0.0068	9.07	0.0248	0.0010	47.82	0.1310	0.0055
Naphthalene	4.07	0.0112	0.0005	0.71	0.0019	0.0001	3.03	0.0083	0.0003
Phenol	0.01	0.0000	0.0000	-	-	-	0.01	0.0000	0.0000
Toluene	27.93	0.0765	0.0032	4.70	0.0129	0.0005	21.20	0.0581	0.0024
Xylene (mixed isomers)	43.05	0.1179	0.0049	7.40	0.0203	0.0008	32.20	0.0882	0.0037
Cumene	0.11	0.0003	0.0000	0.02	0.0001	0.0000	0.08	0.0002	0.0000
Cyclohexane	42.26	0.1158	0.0048	6.75	0.0185	0.0008	33.24	0.0911	0.0038
1,2,4-Trimethylbenzene	12.59	0.0345	0.0014	2.18	0.0060	0.0002	9.37	0.0257	0.0011
Total VOC	5,654.53	15.4919	0.6455	906.11	2.4825	0.1034	4438.71	12.1608	0.5067

(1) Tank leg emissions scaled for 4" legs.

Philips 66 Carson Plant
Crude Tank Total Operational Emissions

	Tank 2640/2641			Tank 2643			Tank R510/R511		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	59.28	0.1624	0.0068	17.58	0.0482	0.0020	6.86	0.0188	0.0008
PACs (Chrysene)	0.09	0.0002	0.0000	0.02	0.0001	0.0000	0.07	0.0002	0.0000
Cresol (mixed isomers)	0.03	0.0001	0.0000	0.00	0.0000	0.0000	0.02	0.0001	0.0000
Ethylbenzene	9.09	0.0249	0.0010	1.89	0.0052	0.0002	5.12	0.0140	0.0006
n-Hexane	754.40	2.0668	0.0861	230.52	0.6316	0.0263	47.82	0.1310	0.0055
Naphthalene	4.09	0.0112	0.0005	0.71	0.0020	0.0001	3.03	0.0083	0.0003
Phenol	0.01	0.0000	0.0000	0.00	0.0000	0.0000	0.01	0.0000	0.0000
Toluene	46.18	0.1265	0.0053	10.51	0.0288	0.0012	21.20	0.0581	0.0024
Xylene (mixed isomers)	43.05	0.1180	0.0049	7.40	0.0203	0.0008	32.20	0.0882	0.0037
Cumene	3.60	0.0099	0.0004	1.13	0.0031	0.0001	0.08	0.0002	0.0000
Cyclohexane	387.52	1.0617	0.0442	116.74	0.3198	0.0133	33.24	0.0911	0.0038
1,2,4-Trimethylbenzene	12.81	0.0351	0.0015	2.25	0.0062	0.0003	9.37	0.0257	0.0011
Total VOC	7,457.98	20.4328	0.8514	1,480.61	4.0565	0.1690	4,438.71	12.1608	0.5067

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2640/2641
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	500000 bbl domed tank (working capacity)

Tank Dimensions

Diameter (ft):	260.00
Volume (gallons):	21,000,000.00
Turnovers:	57.60

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	6
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	260
Automatic Gauge Float Well/Bolted Cover, Gasketed	3
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

2640/2641 - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP 7)	Jan	61.79	56.79	66.79	64.33	4.7172	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0074	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0156	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.0663	N/A	N/A	49.4256	0.9618	0.9728	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Feb	62.78	57.67	67.88	64.33	4.8016	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0075	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0157	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.1562	N/A	N/A	49.4204	0.9618	0.9725	215.18	
Xylenes (mixed isomers)						0.0995	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Mar	63.78	58.57	68.99	64.33	4.8887	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0075	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0158	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.2489	N/A	N/A	49.4151	0.9618	0.9723	215.18	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Apr	65.70	59.89	71.51	64.33	5.0590	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79

Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0077	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0160	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.4303	N/A	N/A	49.4048	0.9618	0.9718	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	May	67.27	61.79	72.76	64.33	5.2015	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0078	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0162	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.5820	N/A	N/A	49.3954	0.9618	0.9714	215.18	
Xylenes (mixed isomers)						0.1182	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Jun	68.98	63.35	74.61	64.33	5.3596	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0079	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0164	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.7502	N/A	N/A	49.3872	0.9618	0.9710	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Jul	71.26	65.04	77.47	64.33	5.5770	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0081	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0167	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0020	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.9814	N/A	N/A	49.3749	0.9618	0.9704	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Aug	71.60	65.63	77.58	64.33	5.6104	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0017	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0081	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21

Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0168	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0020	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						6.0170	N/A	N/A	49.3730	0.9618	0.9704	215.18	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Sep	70.17	64.65	75.68	64.33	5.4719	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0080	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0166	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.8697	N/A	N/A	49.3808	0.9618	0.9707	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Oct	67.76	62.48	73.04	64.33	5.2463	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0078	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0163	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.6296	N/A	N/A	49.3938	0.9618	0.9713	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Nov	64.31	59.22	69.40	64.33	4.9350	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0076	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0159	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.2983	N/A	N/A	49.4123	0.9618	0.9722	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Dec	61.76	56.83	66.70	64.33	4.7152	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0074	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0156	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.0641	N/A	N/A	49.4257	0.9618	0.9728	215.18	

Xylenes (mixed isomers)	0.0961	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2640/2641 - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	25.0698	25.6162	26.1846	27.3105	28.2670	29.3441	30.8538	31.0891	30.1202	28.5702	26.4889	25.0567
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph) ^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0964	0.0985	0.1007	0.1050	0.1087	0.1129	0.1187	0.1196	0.1158	0.1099	0.1019	0.0964
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.7172	4.8016	4.8887	5.0590	5.2015	5.3596	5.5770	5.6104	5.4719	5.2463	4.9350	4.7152
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166
Net Throughput (gal/mo.):	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Roof Fitting Losses (lb):	53.9435	55.1193	56.3422	58.7649	60.8229	63.1405	66.3890	66.8955	64.8106	61.4754	56.9969	53.9153
Value of Vapor Pressure Function:	0.0964	0.0985	0.1007	0.1050	0.1087	0.1129	0.1187	0.1196	0.1158	0.1099	0.1019	0.0964
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700	335.6700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	449.8299	451.5521	453.3435	456.8921	459.9065	463.3012	468.0593	468.8012	465.7474	460.8622	454.3024	449.7886

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	6	6.20	1.20	0.94	79.6762
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	29.9856
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	1.0067
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	260	0.82	0.53	0.14	456.6386
Automatic Gauge Float Well/Bolted Cover, Gasketed	3	2.80	0.00	0.00	17.9914
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	13.7077
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	119.9426

TANKS 4.0.9d

Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2640/2641 - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP 7)	333.97	4,449.80	718.62	0.00	5,502.39
1,2,4-Trimethylbenzene	0.02	12.51	0.04	0.00	12.58
Benzene	0.53	6.29	1.13	0.00	7.95
Chrysene	0.00	0.09	0.00	0.00	0.09
Cresol (-m)	0.00	0.03	0.00	0.00	0.03
Cumene	0.00	0.11	0.00	0.00	0.11
Cyclohexene	2.59	32.93	5.57	0.00	41.08
Ethylbenzene	0.05	6.64	0.12	0.00	6.81
Hexane (-n)	5.40	39.75	11.61	0.00	56.76
Naphthalene	0.00	4.07	0.00	0.00	4.07
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	0.62	25.69	1.34	0.00	27.65
Unidentified Components	324.48	4,279.66	698.18	0.00	5,302.33
Xylenes (mixed isomers)	0.29	42.01	0.62	0.00	42.92

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2640 legless
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	500000 bbl domed tank (working capacity) - Legless

Tank Dimensions

Diameter (ft):	260.00
Volume (gallons):	21,000,000.00
Turnovers:	57.60

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	6
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Automatic Gauge Float Well/Bolted Cover, Gasketed	3
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

2640 legless - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP 7)	Jan	61.79	56.79	66.79	64.33	4.7172	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0074	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0156	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.0663	N/A	N/A	49.4256	0.9618	0.9728	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Feb	62.78	57.67	67.88	64.33	4.8016	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0075	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0157	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.1562	N/A	N/A	49.4204	0.9618	0.9725	215.18	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Mar	63.78	58.57	68.99	64.33	4.8887	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0075	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0158	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.2489	N/A	N/A	49.4151	0.9618	0.9723	215.18	

Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Apr	65.70	59.89	71.51	64.33	5.0590	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0077	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0160	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0016	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.4303	N/A	N/A	49.4048	0.9518	0.9718	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	May	67.27	61.79	72.76	64.33	5.2015	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0078	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0162	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.5820	N/A	N/A	49.3954	0.9518	0.9714	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Jun	68.98	63.35	74.61	64.33	5.3596	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0079	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0164	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.7502	N/A	N/A	49.3872	0.9518	0.9710	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Jul	71.26	65.04	77.47	64.33	5.5770	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0081	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0167	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0020	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.9814	N/A	N/A	49.3749	0.9518	0.9704	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Aug	71.60	65.63	77.58	64.33	5.6104	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0017	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439

Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0081	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0168	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0020	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						6.0170	N/A	N/A	49.3730	0.9518	0.9704	215.18	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Sep	70.17	64.65	75.68	64.33	5.4719	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0080	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0166	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.8697	N/A	N/A	49.3808	0.9618	0.9707	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Oct	67.76	62.48	73.04	64.33	5.2463	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0078	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0163	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.6296	N/A	N/A	49.3938	0.9518	0.9713	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Nov	64.31	59.22	69.40	64.33	4.9350	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0076	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0159	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.2983	N/A	N/A	49.4123	0.9618	0.9722	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Dec	61.76	56.83	66.70	64.33	4.7152	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0074	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0156	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene	0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol	0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene	0.3487	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components	5.0641	N/A	N/A	49.4257	0.9518	0.9728	215.18	
Xylenes (mixed isomers)	0.0981	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2640 legless - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	25.0698	25.6162	26.1846	27.3105	28.2670	29.3441	30.8538	31.0891	30.1202	28.5702	26.4889	25.0567
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph) ^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0964	0.0985	0.1007	0.1050	0.1087	0.1129	0.1187	0.1196	0.1158	0.1099	0.1019	0.0964
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.7172	4.8016	4.8887	5.0590	5.2015	5.3598	5.5770	5.6104	5.4719	5.2463	4.9350	4.7152
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166	370.8166
Net Throughput (gal/mo.):	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000	100,800,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Roof Fitting Losses (lb):	19.6814	20.1104	20.5566	21.4405	22.1914	23.0370	24.2222	24.4070	23.6463	22.4295	20.7955	19.6711
Value of Vapor Pressure Function:	0.0964	0.0985	0.1007	0.1050	0.1087	0.1129	0.1187	0.1196	0.1158	0.1099	0.1019	0.0964
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700	122.4700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	415.5678	416.5433	417.5578	419.5677	421.2750	423.1976	425.8925	426.3127	424.5831	421.8163	418.1009	415.5445

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	6	6.20	1.20	0.94	79.6762
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	29.9856
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	1.0067
Automatic Gauge Float Well/Bolted Cover, Gasketed	3	2.80	0.00	0.00	17.9914
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	13.7077
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	119.9426

TANKS 4.0.9d

Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2640 legless - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP 7)	333.97	4,449.80	262.19	0.00	5,045.96
1,2,4-Trimethylbenzene	0.02	12.51	0.02	0.00	12.55
Benzene	0.53	6.29	0.41	0.00	7.23
Chrysene	0.00	0.09	0.00	0.00	0.09
Cresol (-m)	0.00	0.03	0.00	0.00	0.03
Cumene	0.00	0.11	0.00	0.00	0.11
Cyclohexene	2.59	32.93	2.03	0.00	37.55
Ethylbenzene	0.05	6.64	0.04	0.00	6.74
Hexane (-n)	5.40	39.75	4.24	0.00	49.39
Naphthalene	0.00	4.07	0.00	0.00	4.07
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	0.62	25.69	0.49	0.00	26.80
Unidentified Components	324.48	4,279.66	254.73	0.00	4,858.87
Xylenes (mixed isomers)	0.29	42.01	0.22	0.00	42.53

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	T2643
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	10000bbl (working capacity) domed water surge tank

Tank Dimensions

Diameter (ft):	40.00
Volume (gallons):	420,000.00
Turnovers:	76.80

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	15

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T2643 - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP 7)	Jan	61.79	56.79	66.79	64.33	4.7172	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0074	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0156	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.0663	N/A	N/A	49.4256	0.9618	0.9728	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Feb	62.78	57.67	67.88	64.33	4.8016	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0075	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0157	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.1562	N/A	N/A	49.4204	0.9618	0.9725	215.18	
Xylenes (mixed isomers)						0.0998	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Mar	63.78	58.57	68.99	64.33	4.8887	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0075	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0158	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.2489	N/A	N/A	49.4151	0.9618	0.9723	215.18	

Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Apr	65.70	59.89	71.51	64.33	5.0590	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0077	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0160	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.4303	N/A	N/A	49.4048	0.9618	0.9718	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	May	67.27	61.79	72.76	64.33	5.2015	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0078	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0162	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.5820	N/A	N/A	49.3964	0.9618	0.9714	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Jun	68.98	63.35	74.61	64.33	5.3596	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0079	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0164	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.7502	N/A	N/A	49.3872	0.9618	0.9710	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Jul	71.26	65.04	77.47	64.33	5.5770	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0081	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0167	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0020	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.9814	N/A	N/A	49.3749	0.9618	0.9704	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Aug	71.60	65.63	77.58	64.33	5.6104	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0017	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439

Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0081	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0168	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0020	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						6.0170	N/A	N/A	49.3730	0.9618	0.9704	215.18	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Sep	70.17	64.65	75.68	64.33	5.4719	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0897	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0080	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0166	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.8697	N/A	N/A	49.3808	0.9618	0.9707	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Oct	67.76	62.48	73.04	64.33	5.2463	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0840	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0078	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0163	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.6296	N/A	N/A	49.3938	0.9618	0.9713	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Nov	64.31	59.22	69.40	64.33	4.9350	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0076	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0159	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.2983	N/A	N/A	49.4123	0.9618	0.9722	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Dec	61.76	56.83	66.70	64.33	4.7152	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0074	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0156	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene	0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol	0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene	0.3487	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components	5.0641	N/A	N/A	49.4257	0.9618	0.9726	215.18	
Xylenes (mixed isomers)	0.0961	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T2643 - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	3.8569	3.9410	4.0284	4.2016	4.3488	4.5145	4.7467	4.7829	4.6339	4.3954	4.0752	3.8549
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0964	0.0985	0.1007	0.1050	0.1087	0.1129	0.1187	0.1196	0.1158	0.1099	0.1019	0.0964
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.7172	4.8016	4.8887	5.0590	5.2015	5.3596	5.5770	5.6104	5.4719	5.2463	4.9350	4.7152
Tank Diameter (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749	64.2749
Net Throughput (gal/mo.):	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Roof Fitting Losses (lb):	6.2626	6.3991	6.5411	6.8224	7.0613	7.3304	7.7075	7.7663	7.5243	7.1371	6.6171	6.2594
Value of Vapor Pressure Function:	0.0964	0.0985	0.1007	0.1050	0.1087	0.1129	0.1187	0.1196	0.1158	0.1099	0.1019	0.0964
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700	38.9700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	74.3944	74.6150	74.8444	75.2989	75.6850	76.1197	76.7291	76.8241	76.4330	75.8074	74.9672	74.3891

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	6.8539
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	5.9971
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	13.2794
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	29.9856
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	1.0067
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	15	0.82	0.53	0.14	26.3445

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T2643 - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP 7)	51.38	771.30	83.43	0.00	906.11
1,2,4-Trimethylbenzene	0.00	2.17	0.00	0.00	2.18
Benzene	0.08	1.09	0.13	0.00	1.30
Chrysene	0.00	0.02	0.00	0.00	0.02
Cresol (-m)	0.00	0.00	0.00	0.00	0.00
Cumene	0.00	0.02	0.00	0.00	0.02
Cyclohexene	0.40	5.71	0.65	0.00	6.75
Ethylbenzene	0.01	1.15	0.01	0.00	1.17
Hexane (-n)	0.83	6.89	1.35	0.00	9.07
Naphthalene	0.00	0.71	0.00	0.00	0.71
Phenol	0.00	0.00	0.00	0.00	0.00
Toluene	0.10	4.45	0.16	0.00	4.70
Unidentified Components	49.92	741.81	81.06	0.00	872.78
Xylenes (mixed isomers)	0.04	7.28	0.07	0.00	7.40

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	R510/511
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	285000 bbl tank (working capacity)

Tank Dimensions

Diameter (ft):	218.60
Volume (gallons):	11,970,000.00
Turnovers:	63.16

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Shoe-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	77
Automatic Gauge Float Well/Bolted Cover, Gasketed	2
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d

Emissions Report - Detail Format
Liquid Contents of Storage Tank

R510/511 - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP 7)	Jan	61.79	56.79	66.79	64.33	4.7172	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0074	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0089	0.0156	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.0663	N/A	N/A	49.4256	0.9618	0.9728	215.18	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Feb	62.78	57.67	67.88	64.33	4.8016	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0075	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0089	0.0157	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.1562	N/A	N/A	49.4204	0.9618	0.9725	215.18	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Mar	63.78	58.57	68.99	64.33	4.8887	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0075	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0089	0.0158	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.2489	N/A	N/A	49.4151	0.9618	0.9723	215.18	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Apr	65.70	59.89	71.51	64.33	5.0590	N/A	N/A	50.0000			205.00	Option 4: RVP=7

1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0077	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0089	0.0160	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.4303	N/A	N/A	49.4046	0.9618	0.9718	215.18	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	May	67.27	61.79	72.76	64.33	5.2015	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0078	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0089	0.0162	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.5820	N/A	N/A	49.3984	0.9618	0.9714	215.18	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Jun	68.98	63.35	74.61	64.33	5.3596	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0079	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0089	0.0164	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.7502	N/A	N/A	49.3872	0.9618	0.9710	215.18	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Jul	71.26	65.04	77.47	64.33	5.5770	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0081	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0089	0.0167	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0020	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.9814	N/A	N/A	49.3749	0.9618	0.9704	215.18	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Aug	71.60	65.63	77.58	64.33	5.6104	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0017	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777

Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0081	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0089	0.0168	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0020	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						6.0170	N/A	N/A	49.3730	0.9618	0.9704	215.18	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Sep	70.17	64.65	75.68	64.33	5.4719	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0080	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0089	0.0166	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.8697	N/A	N/A	49.3808	0.9618	0.9707	215.18	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Oct	67.76	62.48	73.04	64.33	5.2463	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0078	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0089	0.0163	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0019	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.6296	N/A	N/A	49.3938	0.9618	0.9713	215.18	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Nov	64.31	59.22	69.40	64.33	4.9350	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0076	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0089	0.0159	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.2983	N/A	N/A	49.4123	0.9618	0.9722	215.18	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP 7)	Dec	61.76	56.83	66.70	64.33	4.7152	N/A	N/A	50.0000			205.00	Option 4: RVP=7
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0015	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0074	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0089	0.0156	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57

Toluene	0.3487	N/A	N/A	92.1300	0.0058	0.0018	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components	5.0841	N/A	N/A	49.4257	0.9618	0.9728	215.18	
Xylenes (mixed isomers)	0.0981	N/A	N/A	106.1700	0.0094	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

R510/511 - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	56.2078	57.4329	58.7072	61.2316	63.3760	65.7909	69.1757	69.7034	67.5311	64.0559	59.3894	56.1784
Seal Factor A (lb-mole/ft-yr):	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000
Value of Vapor Pressure Function:	0.0964	0.0985	0.1007	0.1050	0.1087	0.1129	0.1187	0.1196	0.1158	0.1099	0.1019	0.0964
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.7172	4.8016	4.8887	5.0590	5.2015	5.3596	5.5770	5.6104	5.4719	5.2463	4.9350	4.7152
Tank Diameter (ft):	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528
Net Throughput (gal/mo.):	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.000063	63,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000
Roof Fitting Losses (lb):	28.6824	29.3076	29.9579	31.2461	32.3403	33.5726	35.2999	35.5692	34.4606	32.6873	30.3060	28.6675
Value of Vapor Pressure Function:	0.0964	0.0985	0.1007	0.1050	0.1087	0.1129	0.1187	0.1196	0.1158	0.1099	0.1019	0.0964
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	360.5430	362.3934	364.3179	368.1305	371.3691	375.0163	380.1283	380.9254	377.6445	372.3959	365.3482	360.4987

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	6.8539
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	3.8553
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34	1.30	0.08	0.65	94.6690
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	1.0067
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	26.5587
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	119.9426
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	77	0.53	0.11	0.13	87.4082
Automatic Gauge Float Well/Bolted Cover, Gasketed	2	2.80	0.00	0.00	11.9943
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	29.9856

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

R510/511 - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP 7)	748.78	3,307.83	382.10	0.00	4,438.71
1,2,4-Trimethylbenzene	0.04	9.30	0.02	0.00	9.37
Benzene	1.18	4.68	0.60	0.00	6.46
Chrysene	0.00	0.07	0.00	0.00	0.07
Cresol (-m)	0.00	0.02	0.00	0.00	0.02
Cumene	0.00	0.08	0.00	0.00	0.08
Cyclohexene	5.80	24.48	2.96	0.00	33.24
Ethylbenzene	0.12	4.94	0.06	0.00	5.12
Hexane (-n)	12.10	29.55	6.17	0.00	47.82
Naphthalene	0.00	3.03	0.00	0.00	3.03
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	1.40	19.09	0.71	0.00	21.20
Unidentified Components	727.49	3,181.36	371.23	0.00	4,280.09
Xylenes (mixed isomers)	0.64	31.23	0.33	0.00	32.20

ATTACHMENT C

Tank R510 NSR Balance

572-6321

November 13, 1980

Shell Oil Company
P. O. Box 6249
Carson, CA 90749

Attention: Environmental Conservation Manager

Dear Sir:

Transmitted herewith are the following permits authorizing you to operate the described equipment: 1622 EAST SEPULVEDA BLVD, CARSON

Permit No.	Application No.	Equipment Description
M-12199	C-18847	STORAGE TANK NO. R-513
M-12200	C-18848	STORAGE TANK NO. R-512
M-12251	C-18849	STORAGE TANK NO. R-511
M-12252	C-18850	STORAGE TANK NO. R-510

Rule 206 A person granted a permit under Rule 203 shall not operate or use any equipment unless the entire permit to operate or a legible facsimile of the entire permit is affixed upon the equipment in such a manner that the permit number equipment description and the specified operating conditions are clearly visible and accessible In the event that the equipment is so constructed that the permit to operate or the legible facsimile cannot be so placed the entire permit to operate or the legible facsimile of the entire permit shall be mounted so as to be clearly visible in an accessible place within 8 meters (26 feet) of the equipment or as otherwise approved by the Air Pollution Control Officer

These permits are being issued covering your application on file at the Air Quality Management District.

Very truly yours,

Eric E. Lemke
Chief Deputy Executive Officer

EEL:HT:la
Encs.

Helen Thompson, Permit Section

Rev. 8/78 30D170

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
METROPOLITAN ZONE

ENGINEERING DIVISION - APPLICATION EMISSION DATA SHEET

☑ P/C ☑ Basic Including Spray Booths ☐ Trade-offs ☑ Rule Reduction DATE: 7/10/78

☐ P/O ☐ Control Except Spray Booths ☐ Recall APPL. NO.: C-18850

NAME: SHELL OIL COMPANY

ADDRESS: 1622 EAST SEPULVEDA BLVD., CARSON 90749

☑ Rule 213 Applicable (unit installed or permit to construct issued on or subsequent to 10/8/76).

☐ Rule 213 Not Applicable (unit installed or permit to construct issued prior to 10/8/76, or previously exempt by Rule 219).

Emissions From This Permit Unit

(Complete for basic equipment and spray booths only)

Contaminant	THC	NO_x	SO_2	CO	Part.
Lbs/Hr	4.3	—	—	—	—
Lbs/Day	103.7	—	—	—	—

Altered Permit Unit ☑ Yes ☐ No Prior Permit Number or Date Installed Without Permit PRIOR APPL NO'S: C-03789 (ARCO) T/C <10/11/76 C-08256 (SHELL)

(Complete for basic equipment and spray booths only)

Emissions from previous permit unit:

Contaminant	THC	NO_x	SO_2	CO	Part.
Lbs/Hr	~~16.6~~	—	—	—	—
Lbs/Day	~~398.4~~	—	—	—	—

Mitigations (on premise reductions) Achieved Concurrent With This Application

(Also complete for control equipment except spray booths)

Appl. No	H/C Total		NO_x		SO_2		CO		Part.	
	#/Hr	#/Day	#/Hr	#/Day	#/Hr	#/Day	#/Hr	#/Day	#/Hr	#/Day

BACT Evaluation Not Made ☑ Made ☐ in Appl._____ Date_____

Stationary Source (Entire Facility) Employs BACT Yes ☐ No ☐ UNKNOWN

Engineer [signature]

332-60D792-R1

ATTACHMENT D

Rule 1401 Analysis

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	T2640
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	64	feet
Area (For Volume Source Only)	53100	ft^2
Distance-Residential	750	meters
Distance-Commercial	175	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
S[redacted] output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
B1	Benzene (including benzene from gasoline)	6.77E-03	78.11	0.006767331		0.006767331
P15	Chrysene	1.03E-05	228.2928	1.02768E-05		1.02768E-05
C30	Cresol mixtures	3.43E-06	108.14	3.42801E-06		3.42801E-06
E4	Ethyl benzene	1.04E-03	106.16	0.00103808		0.00103808
H8	Hexane (n-)	8.61E-02	86.18	0.086118305		0.086118305
P30	Naphthalene	4.66E-04	128.1732	0.000466385		0.000466385
P3	Phenol	1.15E-06	94.11	1.14951E-06		1.14951E-06
T3	Toluene (methyl benzene)	5.27E-03	92.13	0.005272006		0.005272006
X1	Xylenes (isomers and mixtures)	4.91E-03	106.2	0.004914934		0.004914934
				0		
				0		
[redacted]				0		
				0		
				0		

TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N: T2640
Fac: 171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors tables

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.25	13.3
Commercial	2.6475	80.25

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

D-2

Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	6.77E-03	6.77E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	1.03E-05	1.03E-05	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	3.43E-06	3.43E-06		1	1	1	1.0000	600	
Ethyl benzene	1.04E-03	1.04E-03	8.70E-03	1	1	1	1	2000	
Hexane (n-)	8.61E-02	8.61E-02		1.0000	1.0000	1	1	7000	
Naphthalene	4.66E-04	4.66E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	1.15E-06	1.15E-06		1	1	1	1	200	5800
Toluene (methyl benzene)	5.27E-03	5.27E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	4.91E-03	4.91E-03		1.0000	1.0000	1	1	700	22000

D-3

Attachment D

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	6.77E-03	6.77E-03	59.1194023	0.029559701
Chrysene	1.03E-05	1.03E-05	0.08977779	4.48889E-05
Cresol mixtures	3.43E-06	3.43E-06	0.02994713	1.49736E-05
Ethyl benzene	1.04E-03	1.04E-03	9.06866544	0.004534333
Hexane (n-)	8.61E-02	8.61E-02	752.329513	0.376164756
Naphthalene	4.66E-04	4.66E-04	4.07433527	0.002037168
Phenol	1.15E-06	1.15E-06	0.01004211	5.02105E-06
Toluene (methyl benzene)	5.27E-03	5.27E-03	46.0562405	0.02302812
Xylenes (isomers and mixtures)	4.91E-03	4.91E-03	42.936863	0.021468432
Total	1.05E-01	1.05E-01	9.14E+02	4.57E-01

Attachment D

A/N: T2640 **Application deemed complete date:** 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	2.12E-07	4.39E-07
Chrysene	3.74E-09	3.80E-09
Cresol mixtures		
Ethyl benzene	2.83E-09	5.85E-09
Hexane (n-)		
Naphthalene	1.75E-08	3.63E-08
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**2.36E-07**	**4.85E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

D-5

Attachment D

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		6.01E-06	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		6.58E-08	Pass	Pass
Developmental - DEV	4.29E-04	1.50E-03	Pass	Pass
Endocrine system - END		5.94E-06	Pass	Pass
Eye	2.94E-05		Pass	Pass
Hematopoietic system - HEM	4.18E-04	1.29E-03	Pass	Pass
Immune system - IMM	4.18E-04		Pass	Pass
Kidney - KID		6.01E-06	Pass	Pass
Nervous system - NS	1.14E-05	1.71E-03	Pass	Pass
Reproductive system - REP	4.29E-04		Pass	Pass
Respiratory system - RES	2.94E-05	8.75E-04	Pass	Pass
Skin			Pass	Pass

A/N: T2640 **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential								
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			6.92E-05		6.92E-05	6.92E-05		6.92E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				2.64E-09					2.64E-09	
Toluene (methyl benzene)			1.90E-06	1.90E-06			1.90E-06	1.90E-06	1.90E-06	
Xylenes (isomers and mixtures)				2.97E-06					2.97E-06	
Total			7.11E-05	4.87E-06	6.92E-05	6.92E-05	1.90E-06	7.11E-05	4.87E-06	

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Attachment D

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			4.18E-04		4.18E-04	4.18E-04		4.18E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				1.59E-08					1.59E-08	
Toluene (methyl benzene)			1.14E-05	1.14E-05			1.14E-05	1.14E-05	1.14E-05	
Xylenes (isomers and mixtures)				1.79E-05					1.79E-05	
Total			4.29E-04	2.94E-05	4.18E-04	4.18E-04	1.14E-05	4.29E-04	2.94E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.22E-04			1.22E-04			1.22E-04			
Chrysene													
Cresol mixtures										6.18E-09			
Ethyl benzene	5.61E-07			5.61E-07	5.61E-07				5.61E-07				
Hexane (n-)										1.33E-05			
Naphthalene												5.60E-05	
Phenol	6.21E-09		6.21E-09						6.21E-09	6.21E-09			
Toluene (methyl benzene)				1.90E-05						1.90E-05		1.90E-05	
Xylenes (isomers and mixtures)										7.59E-06		7.59E-06	
Total	5.67E-07		6.21E-09	1.41E-04	5.61E-07		1.22E-04		5.67E-07	1.62E-04		8.26E-05	

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Attachment D

A/N: T2640 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.29E-03			1.29E-03			1.29E-03			
Chrysene													
Cresol mixtures										6.54E-08			
Ethyl benzene	5.94E-06			5.94E-06	5.94E-06				5.94E-06				
Hexane (n-)										1.41E-04			
Naphthalene												5.93E-04	
Phenol	6.58E-08		6.58E-08						6.58E-08	6.58E-08			
Toluene (methyl benzene)				2.01E-04						2.01E-04		2.01E-04	
Xylenes (isomers and mixtures)										8.04E-05		8.04E-05	
Total	6.01E-06		6.58E-08	1.50E-03	5.94E-06		1.29E-03		6.01E-06	1.71E-03		8.75E-04	

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Attachment D

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	T2641
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	64	feet
Area (For Volume Source Only)	53100	ft^2
Distance-Residential	750	meters
Distance-Commercial	175	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
[redacted] output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
B1	Benzene (including benzene from gasoline)	6.77E-03	78.11	0.006767331		0.006767331
P15	Chrysene	1.03E-05	228.2928	1.02768E-05		1.02768E-05
C30	Cresol mixtures	3.43E-06	108.14	3.42801E-06		3.42801E-06
E4	Ethyl benzene	1.04E-03	106.16	0.00103808		0.00103808
H8	Hexane (n-)	8.61E-02	86.18	0.086118305		0.086118305
P30	Naphthalene	4.66E-04	128.1732	0.000466385		0.000466385
P3	Phenol	1.15E-06	94.11	1.14951E-06		1.14951E-06
T3	Toluene (methyl benzene)	5.27E-03	92.13	0.005272006		0.005272006
X1	Xylenes (isomers and mixtures)	4.91E-03	106.2	0.004914934		0.004914934
				0		
				0		
				0	

TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	T2641
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors table

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.25	13.3
Commercial	2.6475	80.25

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

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Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	6.77E-03	6.77E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	1.03E-05	1.03E-05	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	3.43E-06	3.43E-06		1	1	1	1.0000	600	
Ethyl benzene	1.04E-03	1.04E-03	8.70E-03	1	1	1	1	2000	
Hexane (n-)	8.61E-02	8.61E-02		1.0000	1.0000	1	1	7000	
Naphthalene	4.66E-04	4.66E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	1.15E-06	1.15E-06		1	1	1	1	200	5800
Toluene (methyl benzene)	5.27E-03	5.27E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	4.91E-03	4.91E-03		1.0000	1.0000	1	1	700	22000

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Attachment D

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	6.77E-03	6.77E-03	59.1194023	0.029559701
Chrysene	1.03E-05	1.03E-05	0.08977779	4.48889E-05
Cresol mixtures	3.43E-06	3.43E-06	0.02994713	1.49736E-05
Ethyl benzene	1.04E-03	1.04E-03	9.06866544	0.004534333
Hexane (n-)	8.61E-02	8.61E-02	752.329513	0.376164756
Naphthalene	4.66E-04	4.66E-04	4.07433527	0.002037168
Phenol	1.15E-06	1.15E-06	0.01004211	5.02105E-06
Toluene (methyl benzene)	5.27E-03	5.27E-03	46.0562405	0.02302812
Xylenes (isomers and mixtures)	4.91E-03	4.91E-03	42.936863	0.021468432
Total	1.05E-01	1.05E-01	9.14E+02	4.57E-01

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Attachment D

A/N: T2641 Application deemed complete date: 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	2.12E-07	4.39E-07
Chrysene	3.74E-09	3.80E-09
Cresol mixtures		
Ethyl benzene	2.83E-09	5.85E-09
Hexane (n-)		
Naphthalene	1.75E-08	3.63E-08
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**2.36E-07**	**4.85E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

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Attachment D

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		6.01E-06	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		6.58E-08	Pass	Pass
Developmental - DEV	4.29E-04	1.50E-03	Pass	Pass
Endocrine system - END		5.94E-06	Pass	Pass
Eye	2.94E-05		Pass	Pass
Hematopoietic system - HEM	4.18E-04	1.29E-03	Pass	Pass
Immune system - IMM	4.18E-04		Pass	Pass
Kidney - KID		6.01E-06	Pass	Pass
Nervous system - NS	1.14E-05	1.71E-03	Pass	Pass
Reproductive system - REP	4.29E-04		Pass	Pass
Respiratory system - RES	2.94E-05	8.75E-04	Pass	Pass
Skin			Pass	Pass

A/N: T2641 Application deemed complete date: 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			6.92E-05		6.92E-05	6.92E-05		6.92E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				2.64E-09					2.64E-09	
Toluene (methyl benzene)			1.90E-06	1.90E-06			1.90E-06	1.90E-06	1.90E-06	
Xylenes (isomers and mixtures)				2.97E-06					2.97E-06	
Total			7.11E-05	4.87E-06	6.92E-05	6.92E-05	1.90E-06	7.11E-05	4.87E-06	

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Attachment D

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			4.18E-04		4.18E-04	4.18E-04		4.18E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				1.59E-08					1.59E-08	
Toluene (methyl benzene)			1.14E-05	1.14E-05			1.14E-05	1.14E-05	1.14E-05	
Xylenes (isomers and mixtures)				1.79E-05					1.79E-05	
Total			4.29E-04	2.94E-05	4.18E-04	4.18E-04	1.14E-05	4.29E-04	2.94E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.22E-04			1.22E-04			1.22E-04			
Chrysene													
Cresol mixtures										6.18E-09			
Ethyl benzene	5.61E-07			5.61E-07	5.61E-07				5.61E-07				
Hexane (n-)										1.33E-05			
Naphthalene												5.60E-05	
Phenol	6.21E-09		6.21E-09						6.21E-09	6.21E-09			
Toluene (methyl benzene)				1.90E-05						1.90E-05		1.90E-05	
Xylenes (isomers and mixtures)										7.59E-06		7.59E-06	
Total	5.67E-07		6.21E-09	1.41E-04	5.61E-07		1.22E-04		5.67E-07	1.62E-04		8.26E-05	

A/N: T2641 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.29E-03			1.29E-03			1.29E-03			
Chrysene										6.54E-08			
Cresol mixtures													
Ethyl benzene	5.94E-06			5.94E-06	5.94E-06				5.94E-06				
Hexane (n-)										1.41E-04			
Naphthalene												5.93E-04	
Phenol	6.58E-08		6.58E-08						6.58E-08	6.58E-08			
Toluene (methyl benzene)				2.01E-04						2.01E-04		2.01E-04	
Xylenes (isomers and mixtures)										8.04E-05		8.04E-05	
Total	6.01E-06		6.58E-08	1.50E-03	5.94E-06		1.29E-03		6.01E-06	1.71E-03		8.75E-04	

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Attachment D

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	T2643
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	48	feet
Area (For Volume Source Only)	3000	ft^2
Distance-Residential	700	meters
Distance-Commercial	125	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
S[redacted]output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0 1	lbs/hr
B1	Benzene (including benzene from gasoline)	2.03E-03	78.11	0.002032162		0.002032162
P15	Chrysene	2.28E-06	228.2928	2.28401E-06		2.28401E-06
C30	Cresol mixtures	1.08E-09	108.14	1.08408E-09		1.08408E-09
E4	Ethyl benzene	2.17E-04	106.16	0.000216897		0.000216897
H8	Hexane (n-)	2.67E-02	86.18	0.026666731		0.026666731
P30	Naphthalene	8.16E-05	128.1732	8.16228E-05		8.16228E-05
P3	Phenol	2.57E-09	94.11	2.56972E-09		2.56972E-09
T3	Toluene (methyl benzene)	1.21E-03	92.13	0.001209388		0.001209388
X1	Xylenes (isomers and mixtures)	8.45E-04	106.2	0.000844927		0.000844927
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TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	T2643
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors tables

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.282	16.48
Commercial	4.8075	180

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

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Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	2.03E-03	2.03E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	2.28E-06	2.28E-06	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	1.08E-09	1.08E-09		1	1	1	1.0000	600	
Ethyl benzene	2.17E-04	2.17E-04	8.70E-03	1	1	1	1	2000	
Hexane (n-)	2.67E-02	2.67E-02		1.0000	1.0000	1	1	7000	
Naphthalene	8.16E-05	8.16E-05	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	2.57E-09	2.57E-09		1	1	1	1	200	5800
Toluene (methyl benzene)	1.21E-03	1.21E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	8.45E-04	8.45E-04		1.0000	1.0000	1	1	700	22000

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	2.03E-03	2.03E-03	17.7529684	0.008876484
Chrysene	2.28E-06	2.28E-06	0.01995308	9.97654E-06
Cresol mixtures	1.08E-09	1.08E-09	9.4706E-06	4.73528E-09
Ethyl benzene	2.17E-04	2.17E-04	1.89481337	0.000947407
Hexane (n-)	2.67E-02	2.67E-02	232.960559	0.11648028
Naphthalene	8.16E-05	8.16E-05	0.71305648	0.000356528
Phenol	2.57E-09	2.57E-09	2.2449E-05	1.12245E-08
Toluene (methyl benzene)	1.21E-03	1.21E-03	10.5652147	0.005282607
Xylenes (isomers and mixtures)	8.45E-04	8.45E-04	7.38127901	0.00369064
Total	3.11E-02	3.11E-02	2.71E+02	1.36E-01

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Attachment D

A/N: T2643 Application deemed complete date: 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	7.18E-08	2.39E-07
Chrysene	9.37E-10	1.53E-09
Cresol mixtures		
Ethyl benzene	6.67E-10	2.22E-09
Hexane (n-)		
Naphthalene	3.46E-09	1.15E-08
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**7.69E-08**	**2.54E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

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Attachment D

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		2.25E-06	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		2.67E-10	Pass	Pass
Developmental - DEV	2.87E-04	7.90E-04	Pass	Pass
Endocrine system - END		2.25E-06	Pass	Pass
Eye	1.28E-05		Pass	Pass
Hematopoietic system - HEM	2.81E-04	7.04E-04	Pass	Pass
Immune system - IMM	2.81E-04		Pass	Pass
Kidney - KID		2.25E-06	Pass	Pass
Nervous system - NS	5.88E-06	8.92E-04	Pass	Pass
Reproductive system - REP	2.87E-04		Pass	Pass
Respiratory system - RES	1.28E-05	2.97E-04	Pass	Pass
Skin			Pass	Pass

A/N: T2643 **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			2.58E-05		2.58E-05	2.58E-05		2.58E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				7.30E-12					7.30E-12	
Toluene (methyl benzene)			5.39E-07	5.39E-07			5.39E-07	5.39E-07	5.39E-07	
Xylenes (isomers and mixtures)				6.33E-07					6.33E-07	
Total			2.63E-05	1.17E-06	2.58E-05	2.58E-05	5.39E-07	2.63E-05	1.17E-06	

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Attachment D

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			2.81E-04		2.81E-04	2.81E-04		2.81E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				7.97E-11					7.97E-11	
Toluene (methyl benzene)			5.88E-06	5.88E-06			5.88E-06	5.88E-06	5.88E-06	
Xylenes (isomers and mixtures)				6.91E-06					6.91E-06	
Total			2.87E-04	1.28E-05	2.81E-04	2.81E-04	5.88E-06	2.87E-04	1.28E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				4.13E-05			4.13E-05			4.13E-05			
Chrysene													
Cresol mixtures										2.20E-12			
Ethyl benzene	1.32E-07			1.32E-07	1.32E-07				1.32E-07				
Hexane (n-)										4.65E-06			
Naphthalene												1.11E-05	
Phenol	1.57E-11		1.57E-11						1.57E-11	1.57E-11			
Toluene (methyl benzene)				4.92E-06						4.92E-06		4.92E-06	
Xylenes (isomers and mixtures)										1.47E-06		1.47E-06	
Total	1.32E-07		1.57E-11	4.64E-05	1.32E-07		4.13E-05		1.32E-07	5.23E-05		1.74E-05	

A/N: T2643 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				7.04E-04			7.04E-04			7.04E-04			
Chrysene													
Cresol mixtures										3.76E-11			
Ethyl benzene	2.25E-06			2.25E-06	2.25E-06				2.25E-06				
Hexane (n-)										7.92E-05			
Naphthalene												1.89E-04	
Phenol	2.67E-10		2.67E-10						2.67E-10	2.67E-10			
Toluene (methyl benzene)				8.38E-05						8.38E-05		8.38E-05	
Xylenes (isomers and mixtures)										2.51E-05		2.51E-05	
Total	2.25E-06		2.67E-10	7.90E-04	2.25E-06		7.04E-04		2.25E-06	8.92E-04		2.97E-04	

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Attachment D

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	R510
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	50	feet
Area (For Volume Source Only)	47742.25	ft^2
Distance-Residential	650	meters
Distance-Commercial	50	meters
Meteorological Station	Long Beach	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	
Emission Units	lb/hr	
[redacted] output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0 1	lbs/hr
B1	Benzene (including benzene from gasoline)	7.83E-04	78.11	0.000783105		0.000783105
P15	Chrysene	7.99E-06	228.2928	7.99087E-06		7.99087E-06
C30	Cresol mixtures	2.28E-06	108.14	2.28311E-06		2.28311E-06
E4	Ethyl benzene	5.84E-04	106.16	0.000584475		0.000584475
H8	Hexane (n-)	5.46E-03	86.18	0.005458904		0.005458904
P30	Naphthalene	3.46E-04	128.1732	0.00034589		0.00034589
P3	Phenol	1.14E-06	94.11	1.14155E-06		1.14155E-06
T3	Toluene (methyl benzene)	2.42E-03	92.13	0.002420091		0.002420091
X1	Xylenes (isomers and mixtures)	3.68E-03	106.2	0.003675799		0.003675799
				0		
				0		
[redacted]				0		
				0		
				0		
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TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	R510
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors table:

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.302	15.7
Commercial	13.05	213.8

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

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Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	7.83E-04	7.83E-04	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	7.99E-06	7.99E-06	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	2.28E-06	2.28E-06		1	1	1	1.0000	600	
Ethyl benzene	5.84E-04	5.84E-04	8.70E-03	1	1	1	1	2000	
Hexane (n-)	5.46E-03	5.46E-03		1.0000	1.0000	1	1	7000	
Naphthalene	3.46E-04	3.46E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	1.14E-06	1.14E-06		1	1	1	1	200	5800
Toluene (methyl benzene)	2.42E-03	2.42E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	3.68E-03	3.68E-03		1.0000	1.0000	1	1	700	22000

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	7.83E-04	7.83E-04	6.84120548	0.003420603
Chrysene	7.99E-06	7.99E-06	0.06980822	3.49041E-05
Cresol mixtures	2.28E-06	2.28E-06	0.01994521	9.9726E-06
Ethyl benzene	5.84E-04	5.84E-04	5.1059726	0.002552986
Hexane (n-)	5.46E-03	5.46E-03	47.6889863	0.023844493
Naphthalene	3.46E-04	3.46E-04	3.02169863	0.001510849
Phenol	1.14E-06	1.14E-06	0.0099726	4.9863E-06
Toluene (methyl benzene)	2.42E-03	2.42E-03	21.1419178	0.010570959
Xylenes (isomers and mixtures)	3.68E-03	3.68E-03	32.1117808	0.01605589
Total	1.33E-02	1.33E-02	1.16E+02	5.80E-02

A/N: R510 Application deemed complete date: 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	2.96E-08	2.50E-07
Chrysene	3.51E-09	1.46E-08
Cresol mixtures		
Ethyl benzene	1.93E-09	1.62E-08
Hexane (n-)		
Naphthalene	1.57E-08	1.33E-07
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**5.08E-08**	**4.14E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		1.68E-05	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		3.22E-07	Pass	Pass
Developmental - DEV	1.43E-04	1.21E-03	Pass	Pass
Endocrine system - END		1.65E-05	Pass	Pass
Eye	4.97E-05		Pass	Pass
Hematopoietic system - HEM	1.29E-04	7.37E-04	Pass	Pass
Immune system - IMM	1.29E-04		Pass	Pass
Kidney - KID		1.68E-05	Pass	Pass
Nervous system - NS	1.40E-05	1.53E-03	Pass	Pass
Reproductive system - REP	1.43E-04		Pass	Pass
Respiratory system - RES	4.97E-05	2.92E-03	Pass	Pass
Skin			Pass	Pass

A/N: R510 **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential								
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			9.46E-06		9.46E-06	9.46E-06		9.46E-06		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				3.09E-09					3.09E-09	
Toluene (methyl benzene)			1.03E-06	1.03E-06			1.03E-06	1.03E-06	1.03E-06	
Xylenes (isomers and mixtures)				2.62E-06					2.62E-06	
Total			1.05E-05	3.65E-06	9.46E-06	9.46E-06	1.03E-06	1.05E-05	3.65E-06	

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			1.29E-04		1.29E-04	1.29E-04		1.29E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				4.21E-08					4.21E-08	
Toluene (methyl benzene)			1.40E-05	1.40E-05			1.40E-05	1.40E-05	1.40E-05	
Xylenes (isomers and mixtures)				3.57E-05					3.57E-05	
Total			1.43E-04	4.97E-05	1.29E-04	1.29E-04	1.40E-05	1.43E-04	4.97E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.70E-05			1.70E-05			1.70E-05			
Chrysene													
Cresol mixtures										4.97E-09			
Ethyl benzene	3.82E-07			3.82E-07	3.82E-07				3.82E-07				
Hexane (n-)										1.02E-06			
Naphthalene												5.02E-05	
Phenol	7.45E-09		7.45E-09						7.45E-09	7.45E-09			
Toluene (methyl benzene)				1.05E-05						1.05E-05		1.05E-05	
Xylenes (isomers and mixtures)										6.86E-06		6.86E-06	
Total	3.89E-07		7.45E-09	2.80E-05	3.82E-07		1.70E-05		3.89E-07	3.55E-05		6.76E-05	

A/N: R510 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				7.37E-04			7.37E-04			7.37E-04			
Chrysene													
Cresol mixtures										2.15E-07			
Ethyl benzene	1.65E-05			1.65E-05	1.65E-05				1.65E-05				
Hexane (n-)										4.40E-05			
Naphthalene												2.17E-03	
Phenol	3.22E-07		3.22E-07						3.22E-07	3.22E-07			
Toluene (methyl benzene)				4.55E-04						4.55E-04		4.55E-04	
Xylenes (isomers and mixtures)										2.96E-04		2.96E-04	
Total	1.68E-05		3.22E-07	1.21E-03	1.65E-05		7.37E-04		1.68E-05	1.53E-03		2.92E-03	

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Attachment D

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	09/10/10
A/N:	R511
Fac:	171107

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	V	P or V
Stack Height or Building Height	50	feet
Area (For Volume Source Only)	47742.25	ft^2
Distance-Residential	550	meters
Distance-Commercial	50	meters
Meteorological Station	Long Beach	

Source Type:	O - Other
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO

Emission Units	lb/hr	
S[redacted]output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
B1	Benzene (including benzene from gasoline)	7.83E-04	78.11	0.000783105		0.000783105
P15	Chrysene	7.99E-06	228.2928	7.99087E-06		7.99087E-06
C30	Cresol mixtures	2.28E-06	108.14	2.28311E-06		2.28311E-06
E4	Ethyl benzene	5.84E-04	106.16	0.000584475		0.000584475
H8	Hexane (n-)	5.46E-03	86.18	0.005458904		0.005458904
P30	Naphthalene	3.46E-04	128.1732	0.00034589		0.00034589
P3	Phenol	1.14E-06	94.11	1.14155E-06		1.14155E-06
T3	Toluene (methyl benzene)	2.42E-03	92.13	0.002420091		0.002420091
X1	Xylenes (isomers and mixtures)	3.68E-03	106.2	0.003675799		0.003675799
				0		
				0		
				0	

TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	R511
Fac:	171107

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.99
4 hr	0.92
6 or 7 hrs	0.87

Dispersion Factors tables

5	For Chronic X/Q
7	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.354	18.1
Commercial	13.05	213.8

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

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Attachment D

3. Rule 1401 Compound Data

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	7.83E-04	7.83E-04	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Chrysene	7.99E-06	7.99E-06	3.90E-02	29.75970425	14.62107209	1	1		
Cresol mixtures	2.28E-06	2.28E-06		1	1	1	1.0000	600	
Ethyl benzene	5.84E-04	5.84E-04	8.70E-03	1	1	1	1	2000	
Hexane (n-)	5.46E-03	5.46E-03		1.0000	1.0000	1	1	7000	
Naphthalene	3.46E-04	3.46E-04	1.20E-01	1.0000	1.0000	1	1	9	
Phenol	1.14E-06	1.14E-06		1	1	1	1	200	5800
Toluene (methyl benzene)	2.42E-03	2.42E-03		1	1	1	1	300	37000
Xylenes (isomers and mixtures)	3.68E-03	3.68E-03		1.0000	1.0000	1	1	700	22000

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	7.83E-04	7.83E-04	6.84120548	0.003420603
Chrysene	7.99E-06	7.99E-06	0.06980822	3.49041E-05
Cresol mixtures	2.28E-06	2.28E-06	0.01994521	9.9726E-06
Ethyl benzene	5.84E-04	5.84E-04	5.1059726	0.002552986
Hexane (n-)	5.46E-03	5.46E-03	47.6889863	0.023844493
Naphthalene	3.46E-04	3.46E-04	3.02169863	0.001510849
Phenol	1.14E-06	1.14E-06	0.0099726	4.9863E-06
Toluene (methyl benzene)	2.42E-03	2.42E-03	21.1419178	0.010570959
Xylenes (isomers and mixtures)	3.68E-03	3.68E-03	32.1117808	0.01605589
Total	1.33E-02	1.33E-02	1.16E+02	5.80E-02

A/N: R511 Application deemed complete date: 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	3.48E-08	2.50E-07
Chrysene	4.12E-09	1.46E-08
Cresol mixtures		
Ethyl benzene	2.26E-09	1.62E-08
Hexane (n-)		
Naphthalene	1.84E-08	1.33E-07
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	**5.95E-08**	**4.14E-07**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	**NO**
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	-
Cancer Burden:	

Attachment D

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		1.68E-05	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		3.22E-07	Pass	Pass
Developmental - DEV	1.43E-04	1.21E-03	Pass	Pass
Endocrine system - END		1.65E-05	Pass	Pass
Eye	4.97E-05		Pass	Pass
Hematopoietic system - HEM	1.29E-04	7.37E-04	Pass	Pass
Immune system - IMM	1.29E-04		Pass	Pass
Kidney - KID		1.68E-05	Pass	Pass
Nervous system - NS	1.40E-05	1.53E-03	Pass	Pass
Reproductive system - REP	1.43E-04		Pass	Pass
Respiratory system - RES	4.97E-05	2.92E-03	Pass	Pass
Skin			Pass	Pass

A/N: R511 **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			1.09E-05		1.09E-05	1.09E-05		1.09E-05		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				3.56E-09					3.56E-09	
Toluene (methyl benzene)			1.18E-06	1.18E-06			1.18E-06	1.18E-06	1.18E-06	
Xylenes (isomers and mixtures)				3.02E-06					3.02E-06	
Total			1.21E-05	4.21E-06	1.09E-05	1.09E-05	1.18E-06	1.21E-05	4.21E-06	

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			1.29E-04		1.29E-04	1.29E-04		1.29E-04		
Chrysene										
Cresol mixtures										
Ethyl benzene										
Hexane (n-)										
Naphthalene										
Phenol				4.21E-08					4.21E-08	
Toluene (methyl benzene)			1.40E-05	1.40E-05			1.40E-05	1.40E-05	1.40E-05	
Xylenes (isomers and mixtures)				3.57E-05					3.57E-05	
Total			1.43E-04	4.97E-05	1.29E-04	1.29E-04	1.40E-05	1.43E-04	4.97E-05	

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				2.00E-05			2.00E-05			2.00E-05			
Chrysene													
Cresol mixtures										5.82E-09			
Ethyl benzene	4.47E-07			4.47E-07	4.47E-07				4.47E-07				
Hexane (n-)										1.19E-06			
Naphthalene												5.88E-05	
Phenol	8.74E-09		8.74E-09						8.74E-09	8.74E-09			
Toluene (methyl benzene)				1.23E-05						1.23E-05		1.23E-05	
Xylenes (isomers and mixtures)										8.04E-06		8.04E-06	
Total	4.56E-07		8.74E-09	3.28E-05	4.47E-07		2.00E-05		4.56E-07	4.16E-05		7.92E-05	

A/N: R511 Application deemed complete date: 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial											
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				7.37E-04			7.37E-04			7.37E-04			
Chrysene													
Cresol mixtures										2.15E-07			
Ethyl benzene	1.65E-05			1.65E-05	1.65E-05				1.65E-05				
Hexane (n-)										4.40E-05			
Naphthalene												2.17E-03	
Phenol	3.22E-07		3.22E-07						3.22E-07	3.22E-07			
Toluene (methyl benzene)				4.55E-04						4.55E-04		4.55E-04	
Xylenes (isomers and mixtures)										2.96E-04		2.96E-04	
Total	1.68E-05		3.22E-07	1.21E-03	1.65E-05		7.37E-04		1.68E-05	1.53E-03		2.92E-03	

South Coast Air Quality Management District

Form 400 - XPP

Express Permit Processing Request

Form 400-A, Form 400-CEQA and one or more 400-E-xx form(s) must accompany all submittals.

Mail To:
SCAQMD
P.O Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

1. **Facility Name** (Business Name of Operator To Appear On The Permit): Phillips 66 Los Angeles Refinery, Carson Plant

2. **Valid AQMD Facility ID** (Available On Permit Or Invoice Issued By AQMD): 171109

Section B - Equipment Location Address

3. (●) Fixed Location ( ) Various Location
(For equipment operated at various locations, provide address of initial site.)

1520 East Sepulveda Boulevard
Street Address

Carson, CA 90745
City State Zip

Knut Beruldsen — Env. Engineer
Contact Name — Title

(310) 952-6504 — — —
Phone # Ext. Fax #

knut.j.beruldsen@p66.com
E-Mail

Section C - Permit Mailing Address

4. Permit and Correspondence Information:
☐ Check here if same as equipment location address

1660 West Anaheim Street
Address

Wilmington, CA 90744
City State Zip

Knut Beruldsen — Env. Engineer
Contact Name — Title

(310) 952-6504 — — —
Phone # Ext. Fax #

knut.j.beruldsen@p66.com
E-Mail

Section D - Authorization/Signature

I understand that the Expedited Permit Processing fees must be submitted at the time of application submittal, and that the application may be subject to additional fees per Rule 301. I understand that requests for Express Permit Processing neither guarantees action by any specific date nor does it guarantee permit approval; that Express Permit Processing is subject to availability of qualified staff; and that once Express Permit Processing has commenced, the expedited fees will not be refunded. I hereby certify that all information contained herein and information submitted with the application are true and correct.

5. Signature of Responsible Official: [signature]

6. Title of Responsible Official: Env. Superintendent

7. Print Name of Responsible Official: Marshall Waller

8. Date: 10/25/12

9. Phone #: (310) 952-6120

10. Fax #:

AQMD USE ONLY	APPLICATION TRACKING #	TYPE B C	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE: $		VALIDATION
ENG. DATE A R	ENG. DATE A R	CLASS I III	ASSIGNMENT Unit Engineer	CHECK/MONEY ORDER #	AMOUNT $	TRACKING #

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South Coast Air Quality Management District

Form 400-CEQA

California Environmental Quality Act (CEQA) Applicability

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

The SCAQMD is required by state law, the California Environmental Quality Act (CEQA), to review discretionary permit project applications for potential air quality and other environmental impacts. This form is a screening tool to assist the SCAQMD in clarifying whether or not the project[1] has the potential to generate significant adverse environmental impacts that might require preparation of a CEQA document [CEQA Guidelines §15060(a)].[2] Refer to the attached instructions for guidance in completing this form.[3] For each Form 400-A application, also complete and submit one Form 400-CEQA. If submitting multiple Form 400-A applications for the same project at the same time, only one 400-CEQA form is necessary for the entire project. If you need assistance completing this form, contact Permit Services at (909) 396-3385 or (909) 396-2668.

Section A - Facility Information

1. Facility Name (Business Name of Operator To Appear On The Permit): Phillips 66 Los Angeles Refinery, Carson Plant

2. Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 171109

3. Project Description:

Installation of two 575K BBL crude oil storage tanks, modification of 2 existing crude tanks, and installation of a 11.5K BBL water draw tank to increase the crude storage capacity of the facility.

Section B - Review For Exemption From Further CEQA Action

Check "Yes" or "No" as applicable

	Yes	No	Is this application for:
1.	◉	○	**A CEQA and/or NEPA document previously or currently prepared that specifically evaluates this project?** If yes, attach a copy of the signed Notice of Determination to this form.
2.	○	◉	**A request for a change of permittee only (without equipment modifications)?**
3.	○	◉	**A functionally identical permit unit replacement with no increase in rating or emissions?**
4.	○	◉	**A change of daily VOC permit limit to a monthly VOC permit limit?**
5.	○	◉	**Equipment damaged as a result of a disaster during state of emergency?**
6.	○	◉	**A Title V** (i.e., Regulation XXX) **permit renewal (without equipment modifications)?**
7.	○	◉	**A Title V administrative permit revision?**
8.	○	◉	**The conversion of an existing permit into an initial Title V permit?**

If "**Yes**" is checked for any question in Section B, your application does not require additional evaluation for CEQA applicability. Skip to Section D - Signatures on page 2 and sign and date this form.

Section C - Review of Impacts Which May Trigger CEQA

Complete Parts I-VI by checking "Yes" or "No" as applicable. To avoid delays in processing your application(s), explain all "Yes" responses on a separate sheet and attach it to this form.

	Yes	No	Part I - General
1.	○	○	**Has this project generated any known public controversy regarding potential adverse impacts that may be generated by the project?** Controversy may be construed as concerns raised by local groups at public meetings; adverse media attention such as negative articles in newspapers or other periodical publications, local news programs, environmental justice issues, etc.
2.	○	○	**Is this project part of a larger project?** If yes, attach a separate sheet to briefly describe the larger project.
			Part II - Air Quality
3.	○	○	**Will there be any demolition, excavating, and/or grading construction activities that encompass an area exceeding 20,000 square feet?**
4.	○	○	**Does this project include the open outdoor storage of dry bulk solid materials that could generate dust?** If Yes, include a plot plan with the application package.

[1] A "project" means the whole of an action which has a potential for resulting in physical change to the environment, including construction activities, clearing or grading of land, improvements to existing structures, and activities or equipment involving the issuance of a permit. For example, a project might include installation of a new, or modification of an existing internal combustion engine, dry-cleaning facility, boiler, gas turbine, spray coating booth, solvent cleaning tank, etc.

[2] To download the CEQA guidelines, visit http://ceres.ca.gov/env_law/state.html.

[3] To download this form and the instructions, visit http://www.aqmd.gov/ceqa or http://www.aqmd.gov/permit

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Section C - Review of Impacts Which May Trigger CEQA (cont.)			
	Yes	No	**Part II - Air Quality (cont.)**
5.	○	○	**Would this project result in noticeable off-site odors from activities that may not be subject to SCAQMD permit requirements?** For example, compost materials or other types of greenwaste (i.e., lawn clippings, tree trimmings, etc.) have the potential to generate odor complaints subject to Rule 402 – Nuisance.
6.	○	○	**Does this project cause an increase of emissions from marine vessels, trains and/or airplanes?**
7.	○	○	**Will the proposed project increase the QUANTITY of hazardous materials stored aboveground onsite or transported by mobile vehicle to or from the site by greater than or equal to the amounts associated with each compound on the attached Table 1?[4]**
			Part III – Water Resources
8.	○	○	**Will the project increase demand for water at the facility by more than 5,000,000 gallons per day?** The following examples identify some, but not all, types of projects that may result in a "yes" answer to this question: 1) projects that generate steam; 2) projects that use water as part of the air pollution control equipment; 3) projects that require water as part of the production process; 4) projects that require new or expansion of existing sewage treatment facilities; 5) projects where water demand exceeds the capacity of the local water purveyor to supply sufficient water for the project; and 6) projects that require new or expansion of existing water supply facilities.
9.	○	○	**Will the project require construction of new water conveyance infrastructure?** Examples of such projects are when water demands exceed the capacity of the local water purveyor to supply sufficient water for the project, or require new or modified sewage treatment facilities such that the project requires new water lines, sewage lines, sewage hook-ups, etc.
			Part IV – Transportation/Circulation
10.			**Will the project result in** (Check all that apply)**:**
	○	○	**a. the need for more than 350 new employees?**
	○	○	**b. an increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round-trips per day?**
	○	○	**c. increase customer traffic by more than 700 visits per day?**
			Part V – Noise
11.	○	○	**Will the project include equipment that will generate noise GREATER THAN 90 decibels (dB) at the property line?**
			Part VI – Public Services
12.			**Will the project create a permanent need for new or additional public services in any of the following areas** (Check all that apply)**:**
	○	○	**a. Solid waste disposal?** Check "No" if the projected potential amount of wastes generated by the project is less than five tons per day.
	○	○	**b. Hazardous waste disposal?** Check "No" if the projected potential amount of hazardous wastes generated by the project is less than 42 cubic yards per day (or equivalent in pounds).

REMINDER: *For each "Yes" response in Section C, attach all pertinent information including but not limited to estimated quantities, volumes, weights, etc.*

Section D - Signatures

I HEREBY CERTIFY THAT ALL INFORMATION CONTAINED HEREIN AND INFORMATION SUBMITTED WITH THIS APPLICATION IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE. I UNDERSTAND THAT THIS FORM IS A SCREENING TOOL AND THAT THE SCAQMD RESERVES THE RIGHT TO CONSIDER OTHER PERTINENT INFORMATION IN DETERMINING CEQA APPLICABILITY.

1. Signature of Responsible Official of Firm:		2. Title of Responsible Official of Firm:
		Env. Superintendent
3. Print Name of Responsible Official of Firm:		4. Date Signed:
Marshall Waller		11/19/12
5. Phone # of Responsible Official of Firm:	6. Fax # of Responsible Official of Firm:	7. Email of Responsible Official of Firm:
(310) 952-6120		marshall.g.waller@p66.com
8. Signature of Preparer, (If prepared by person other than responsible official of firm):		9. Title of Preparer:
Marcia Baver		Project Manager
10. Print Name of Preparer:		11. Date Signed:
Marcia Baverman		11/15/12
12. Phone # of Preparer:	13. Fax # of Preparer:	14. Email of Preparer:
(714) 632-8521	(714) 632-6754	mbaverman@envaudit.com

THIS CONCLUDES FORM 400-CEQA. INCLUDE THIS FORM AND ANY ATTACHMENTS WITH FORM 400-A.

[4] Table 1 – Regulated Substances List and Threshold Quantities for Accidental Release Prevention can be found in the Instructions for Form 400-CEQA.

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South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): Phillips 66 Los Angeles Refinery, Carson Plant

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 171109

Address where the equipment will be operated (for equipment which will be moved to various locations in AQMD's jurisdiction, please list the initial location site): 1520 East Sepulveda Boulevard, Carson, CA 90745

(●) Fixed Location ( ) Various Locations

Tank Type (Select ONE)

( ) External Floating Roof Tank (EFRT) ( ) Internal Floating Roof Tank (IFRT) ( ) Horizontal Tank (HT)
( ) Vertical Fixed Roof Tank (VFRT) (●) Domed External Roof Tank (DEFRT)

Identification

Tank Identification Number: 2640

Tank Contents/Product (include MSDS): Crude Oil with 7.0 RVP

Section B - Tank Information

Tank Characteristics

Shell Diameter (ft.): 260

Shell Length (ft.):

Shell Height (ft.): 64

Turnovers Per Year: 58

Is Tank Heated? ( ) Yes (●) No

Is Tank Underground? ( ) Yes (●) No

Net Throughput (gal/year): 1210MM

Self Support Roof: (●) Yes ( ) No

Number of Columns? 0

Effective Column Diameter: ( ) 9" by 7" Built Up Column - 1.1 ( ) 8" Diameter Pipe - 0.7 ( ) Unknown - 1

External Shell Condition: (●) Good ( ) Poor

Internal Shell Color: (●) Light Rust ( ) Dense Rust ( ) Gunite Lining

External Shell Color: (●) White/White ( ) Aluminum/Specular ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Gray/Medium ( ) Red/Primer

Average Liquid Height (ft.) (Vertical Only): 30

Maximum Liquid Height (ft.) (Vertical Only): 60

Working Volume (gal.) (Vertical Only): 21000000

Actual Volume (gal.) (Vertical Only): 24150000

Paint Condition: (●) Good ( ) Poor

Paint Color/Shade: (●) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Roof Characteristics (Floating Roof Tank)

Roof Type: ( ) Pontoon (●) Dome Roof (Height 55.5 ft.) ( ) Double Deck ( ) Cone Roof (Height _____ ft.)

Roof Fitting Category: ( ) Typical (●) Detail

Roof Height (ft.):

Roof Paint Condition: (●) Good ( ) Poor

Roof Color/Shade: (●) White/White ( ) Aluminum/Diffuse ( ) Gray/Light ( ) Aluminum/Specular ( ) Gray/Medium ( ) Red/Primer

Deck Characteristics (Floating Roof Tank)

Deck Type: (●) Welded ( ) Bolted

Deck Fitting Characteristics: ( ) Typical ( ) Detailed (Complete Deck Seam)

Construction:	Deck Seam Length (ft.):	Deck Seam:
( ) Sheet		( ) 5 ft. wide ( ) 6 ft. wide ( ) 7 ft. wide
( ) Panel		( ) 5 x 7.5 ft. ( ) 5 x 12 ft.

Tank Construction and Rim -Seal System (Floating Roof Tank)

Tank Construction: (●) Welded ( ) Riveted

Primary Seal: (●) Mechanical Shoe ( ) Liquid Mounted ( ) Vapor Mounted

Secondary Seal: (●) Rim Mounted ( ) None ( ) Shoe Mounted

Breather Vent Setting

Vacuum Setting (psig):

Pressure Setting (psig):

* Section D of the application MUST be completed.

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South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section B - Tank Information (cont.)

Site Selection

Nearest Major City: Long Beach

Daily Average Ambient Temperature (°F): 64.31 Annual Average Minimum Temperature (°F): 54.40

Annual Average Maximum Temperature (°F): 74.22 Average Wind Speed (mph): 6.36

Annual Average Solar Insulation Factor (Btu / (ft^3 * ft * day)): 1571.65

Tank Contents

Chemical Category: ○ Organic Liquids ◉ Crude Oil ○ Petroleum Distillates

Liquid: ○ Single ◉ Multiple

If Multiple, Select Speciation Option: ○ Full Speciation ◉ Partial Speciation ○ Various Weight Speciation ○ None

Section C - Operation Information

Vapor Control

Vapor Control During Loading or Unloading: ☐ Sparger ☐ Vapor Balance System ☐ Vapor Return Line ☐ Vented to Air Pollution Control Equipment [1]

[1] A separate permit is required. If APC equipment is already permitted, provide Permit or Device Number: _____

Vent Valve Data

Indicate Type of Setting and Vapor Disposal

	Number	Pressure Setting	Vaccum Setting	Discharging to (Check Appropriate Box)		
				Atmosphere	Vapor Control	Flare
Combination				☐	☐	☐
Pressure				☐	☐	☐
Vaccum				☐	☐	☐
Open				☐	☐	☐

Materials

Name all liquids, vapors, gases, or mixtures of such material to be stored in this tank:
Crude Oil

If material is stored in a solution, supply the following information:

Name of Solvent: _____ Name of Materials Dissolved: _____

Concentration of Materials Dissolved: _____ % by Weight OR _____ % by Volume OR _____ lbs/gal

Section D - Roof/Deck Fitting

Section D is required for the following tanks: External Floating Roof Tank, Internal Floating Roof Tanks, or Domed External Floating Roof Tanks.

Select the number of fittings for each applicable question. Examples: 3 Unbolted Cover, Ungasketed
_____ Unbolted Cover, Gasketed

Roof/Deck Fitting Details

1. Access Hatch (24" diameter well)	2. Automatic Gauge Float Well (20" diameter well)	3. Column Well (24" diameter well)
6 Bolted Cover, Gasketed	3 Bolted Cover, Gasketed	_____ Built-Up Col - Sliding Cover, Gasketed
_____ Unbolted Cover, UnGasketed	_____ Unbolted Cover, Ungasketed	_____ Built-Up Col - Sliding Cover, Ungasketed
_____ Unbolted Cover, Gasketed	_____ Unbolted Cover, Gasketed	_____ Pipe Col - Flex, Fabric Sleeve Seal
		_____ Pipe Col - Sliding Cover, Gasketed
		_____ Pipe Col - Sliding Cover, Ungasketed

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South Coast Air Quality Management District

Form 400-E-18
Storage Tank

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Section D - Roof/Deck Fitting (cont.)

Roof/Deck Fitting Details (cont.)

4. Gauge Hatch/Sample Well (8" diameter well)
- 1 Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

5. Ladder Well (36" diameter)
- ____ Sliding Cover, Gasketed
- ____ Sliding Cover, Ungasketed

6. Rim Vent (6" diameter)
- ____ Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

7. Roof Drain (3" diameter)
- ____ Open
- ____ 90% Close

8. Roof Leg (3" diameter leg)
- ____ Adjustable, Pontoon Area, Ungasketed
- ____ Adjustable, Center Area, Ungasketed
- 260 Adjustable, Double-Deck Roofs
- ____ Fixed
- ____ Adjustable, Pontoon Area, Gasketed
- ____ Adjustable, Pontoon Area, Sock
- ____ Adjustable, Center Area, Gasketed
- ____ Adjustable, Center Area, Sock

9. Roof Leg or Hang Well
- ____ Adjustable
- ____ Fixed

10. Sample Pipe (24" diameter)
- ____ Slotted Pipe – Sliding Cover, Gasketed
- ____ Slotted Pipe – Sliding Cover, Ungasketed
- ____ Slit Fabric Seal, 10% Open

11. Guided Pole/Sample Well
- ____ Ungasketed, Sliding Cover, Without Float
- ____ Ungasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, Without Float
- ____ Gasketed Sliding Cover, With Float
- ____ Gasketed Sliding Cover, With Pole Sleeve
- ____ Gasketed Sliding Cover, With Pole Wiper
- ____ Gasketed Sliding Cover, With Float, Wiper
- ____ Gasketed Sliding Cover, With Float, Sleeve, Wiper
- ____ Gasketed Sliding Cover, With Pole Sleeve, Wiper

12. ____ **Stub Drain (1" diameter)**

13. Unslotted Guide – Pole Well
- ____ Ungasketed, Sliding Cover
- ____ Gasketed Sliding Cover
- ____ Ungasketed Sliding Cover with Sleeve
- ____ Gasketed Sliding Cover with Sleeve
- 1 Gasketed Sliding Cover with Wiper

14. Vacuum Breaker (10" diameter well)
- 6 Weighted Mechanical Actuation, Gasketed
- ____ Weighted Mechanical Actuation, Ungasketed

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: Marcia Baver Date: 11/15/12

Title: Project Manager Company Name: Environmental Audit Inc.

Name: Marcia Baverman

Phone #: (714) 632-8521 Fax #: (714) 632-6754

Email: mbaverman@envaudit.com

Contact Info

Name: Knut Beruldsen

Title: Env. Engineer Company Name: Philips 66

Phone #: (310) 952-6504 Fax #:

Email: knut.j.beruldsen@p66.com

THIS IS A PUBLIC DOCUMENT

Pursuant to the California Public Records Act, your permit application and any supplemental documentation are public records and may be disclosed to a third party. If you wish to claim certain limited information as exempt from disclosure because it qualifies as a trade secret, as defined in the District's Guidelines for Implementing the California Public Records Act, you must make such claim at the time of submittal to the District.

Check here if you claim that this form or its attachments contain confidential trade secret information. ☒

© South Coast Air Quality Management District, Form 400-E-18 (2009.04)

UPS CampusShip: View/Print Label

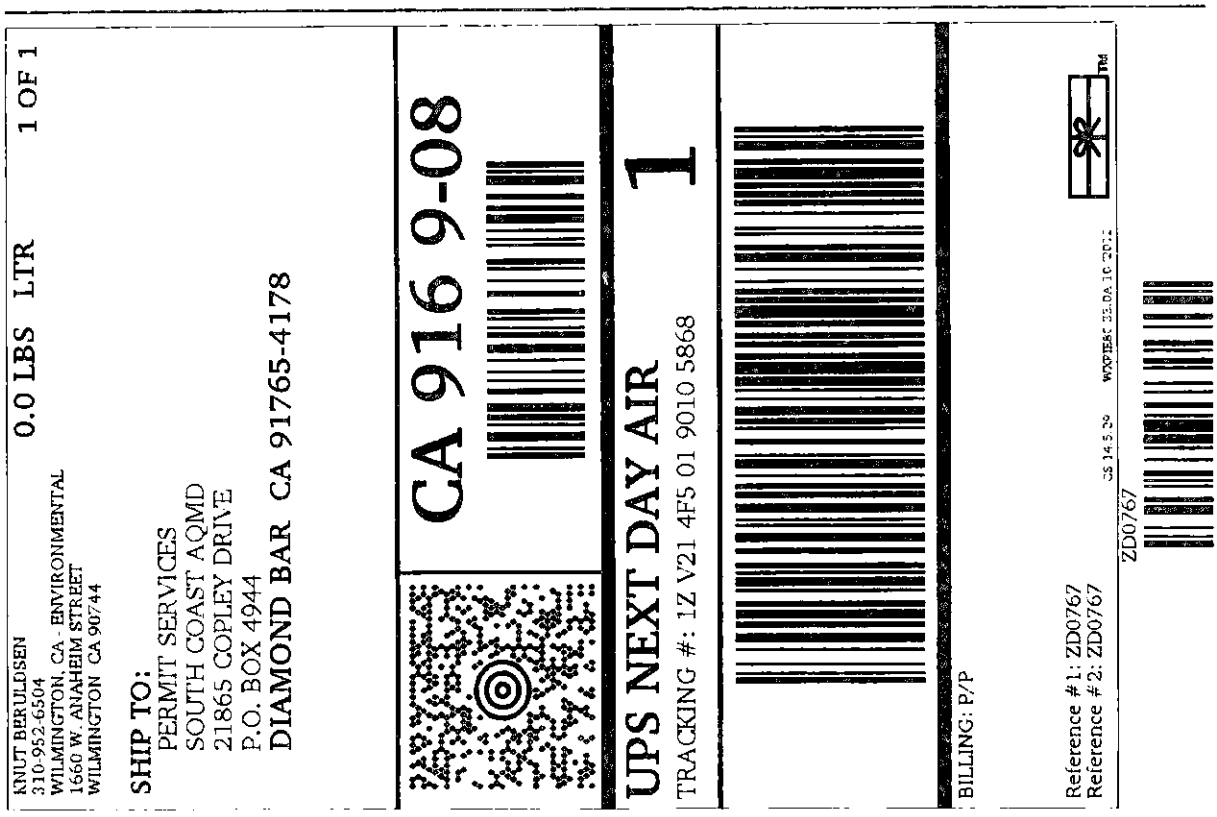
1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.

2. **Fold the printed sheet containing the label at the line so that the entire shipping label is visible. Place the label on a single side of the package and cover it completely with clear plastic shipping tape. Do not cover any seams or closures on the package with the label.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   UPS locations include the UPS Store®, UPS drop boxes, UPS customer centers, authorized retail outlets and UPS drivers.
   Find your closest UPS location at: www.ups.com/dropoff
   Take your package to any location of The UPS Store®, UPS Drop Box, UPS Customer Center, UPS Alliances (Office Depot® or Staples®) or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the Resources area of CampusShip and select UPS Locations.

   Customers with a Daily Pickup
   Your driver will pickup your shipment(s) as usual.

FOLD HERE



Phillips 66
Los Angeles Refinery - Carson Plant
1520 E. Sepulveda Blvd.
Carson, California 90745
P. O. Box 6206
Carson, California 90747
Telephone 310-522-9300
www.phillips66.com

CERTIFIED MAIL RETURN RECEIPT REQUESTED

November 21, 2012

South Coast Air Quality Management District
Attn: Permit Services
P.O. Box 4944
Diamond Bar, CA 91765

NEW CRUDE OIL STORAGE TANKS 2640 & 2641, MODIFIED CRUDE OIL STORAGE TANKS 510 & 511, AND NEW WATER DRAW STORAGE TANK 2643
APPLICATION FOR SIGNIFICANT REVISION OF TITLE V PERMIT
LOS ANGELES REFINERY – CARSON PLANT (ID #171109)

Phillips 66 Company submits the enclosed applications for a "significant permit revision" to the Los Angeles Refinery – Carson Plant Title V permit. The applications are for two new domed external floating roof tanks for crude oil storage, the addition of domes to existing external floating roof tanks 510 and 511, and one new domed external floating roof tank for water draws from the above tanks. The purpose of the project is to increase the storage capacity of crude so that larger ships can unload their entire volume in one call. There will not be an increase in the crude oil processing rate at the refinery as a result of this project. Based on information and belief formed after reasonable inquiry, the statements and information in the enclosed documents has been determined to be true, accurate, and complete.

The information contained in this permit package is considered confidential business information. If there are any questions, please contact Knut J. Beruldsen at (310) 952-6504.

Sincerely,

Chris R. Chandler
Manager, Los Angeles Refinery

Attachments

Ecc: Ms. Janice West, AQMD (w/ attachments)
Submitted via e-mail to:jwest@aqmd.gov

E120470

TITLE V PERMIT APPLICATION
Phillips 66 Company
Los Angeles Refinery Carson Plant
CRUDE OIL STORAGE PROJECT
CONFIDENTIAL

SUMMARY

Phillips 66 Company submits the enclosed applications for a "significant permit revision" to the Los Angeles Refinery – Carson Plant Title V permit.

The application package includes the following:

1) Form 500-A2 Title V Application Certification
2) Form C1 Title V Compliance Status Report
3) Form 400-XPP Express Permit Processing Request
4) Form 400-A (5 total) Permit Application Forms for Tank Nos. 2640, 2641, 2643, 510 and 511
5) Form 400-A for Title V Amendment
6) Form 400-CEQA
7) Form 400-E-18 (5 total) Storage Tank Information
8) Form 400-E-GI Supplemental Information Package
9) Company Check Nos. 00010110, 00010109, 00010107, 00010106, 00010105, and 00010108 for $5,160.09, $2580.05, $5,160.09, $2580.05, $5,160.09 and $1,789.12, respectively, for the permit revision

This check was issued by PHILLIPS 66 COMPANY

DATE	INVOICE(DESCRIPT)	CO	DOCUMENT NO.	GROSS	DISCOUNT	NET
10/18/12	101912C	SY	1200000451 USD	5,160.09	0.00	5,160.09

PAYEE NUMBER	CHECK DATE	CHECK NO	CHECK AMOUNT
119215	10/22/2012	00010105	5160.09

If you have questions about this check, call (918)977-7909
or logon to https://vis.ephillips66.com.

Phillips 66 is currently adopting direct deposit (ACH) as our primary tool for payment in place of checks. Please access the following website http://vendors.phillips66.com/EN/payment/Pages/index.aspx for application instructions. Your prompt response is greatly appreciated.

THIS PORTION IS NON-NEGOTIABLE

THIS PORTION IS NON-NEGOTIABLE

THIS PORTION IS NON-NEGOTIABLE

THIS PORTION IS NON-NEGOTIABLE

THIS PORTION IS NON-NEGOTIABLE

This check was issued by PHILLIPS 66 COMPANY

DATE	INVOICE(DESCRIPT)	CO	DOCUMENT NO.	GROSS	DISCOUNT	NET
10/18/12	101912B	SY	1200000452 USD	2,580.05	0.00	2,580.05

PAYEE NUMBER	CHECK DATE	CHECK NO	CHECK AMOUNT
119215	10/22/2012	00010106	2580.05

If you have questions about this check, call (918)977-7909
or logon to https://vis.ephillips66.com.

Phillips 66 is currently adopting direct deposit (ACH) as our primary tool for payment in place of checks. Please access the following website http://vendors.phillips66.com/EN/payment/Pages/index.aspx for application instructions. Your prompt response is greatly appreciated.

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This check was issued by PHILLIPS 66 COMPANY

DATE	INVOICE(DESCRIPT)	CO	DOCUMENT NO.	GROSS	DISCOUNT	NET
10/18/12	101912A	SY	1200000453 USD	5,160.09	0.00	5,160.09

PAYEE NUMBER	CHECK DATE	CHECK NO	CHECK AMOUNT
119215	10/22/2012	00010107	5160.09

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or logon to https://vis.ephillips66.com.

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This check was issued by PHILLIPS 66 COMPANY

DATE	INVOICE(DESCRIPT)	CO	DOCUMENT NO.	GROSS	DISCOUNT	NET
10/18/12	101912F	SY	1200000454 USD	1,789.12	0.00	1,789.12

PAYEE NUMBER	CHECK DATE	CHECK NO	CHECK AMOUNT
119215	10/22/2012	00010108	1789.12

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This check was issued by PHILLIPS 66 COMPANY

DATE	INVOICE(DESCRIPT)	CO	DOCUMENT NO.	GROSS	DISCOUNT	NET
10/18/12	101912D	SY	1200000455 USD	2,580.05	0.00	2,580.05

PAYEE NUMBER	CHECK DATE	CHECK NO	CHECK AMOUNT
119215	10/22/2012	00010109	2580.05

If you have questions about this check, call (918)977-7909
or logon to https://vis.ephillips66.com.

Phillips 66 is currently adopting direct deposit (ACH) as our primary tool for payment in place of checks. Please access the following website http://vendors.phillips66.com/EN/payment/Pages/index.aspx for application instructions. Your prompt response is greatly appreciated.

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This check was issued by PHILLIPS 66 COMPANY

DATE	INVOICE(DESCRIPT)	CO	DOCUMENT NO.	GROSS	DISCOUNT	NET
10/18/12	101912E	SY	1200000456 USD	5,160.09	0.00	5,160.09

PAYEE NUMBER	CHECK DATE	CHECK NO	CHECK AMOUNT
119215	10/22/2012	00010110	5160.09

If you have questions about this check, call (918)977-7909
or logon to https://vis.ephillips66.com.

Phillips 66 is currently adopting direct deposit (ACH) as our primary tool for payment in place of checks. Please access the following website http://vendors.phillips66.com/EN/payment/Pages/index.aspx for application instructions. Your prompt response is greatly appreciated.

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January 31, 2014

Councilman Buscaino
c/o Jenny Chavez, Chief of Staff,
City of Los Angeles jenny.chavez@lacity.org

Dr. Wallerstein, SCAQMD
bwallerstein@aqmd.gov

Re: Follow-up investigation issues for SCAQMD white paper on tar sands-by-rail to Los Angeles

Dear Councilman Buscaino and Dr. Wallerstein,

Thank you very much for meeting with the California Nurses Association (CNA), Tar Sands Action – Southern California, Communities for a Better Environment (CBE), and other concerned community members on January 9, 2014 regarding proposed tar sands-by-rail projects to South Coast oil refineries. This letter is to follow up on specific issues we request to be evaluated in the tar sands white paper that you offered to produce.

To memorialize some of what has happened so far, on April 2, 2013, CBE and the Natural Resources Defense Council (NRDC) sent a letter to the South Coast Air Quality Management District ("District" or "SCAQMD") requesting an investigation of tar sands-by-rail projects announced by Valero and other refineries (attached). The Los Angeles Times covered this.[1] At the SCAQMD April 5th Governing Board meeting that same week, other community members also asked the Board of Directors to investigate tar sands.[2] In response, Dr. Wallerstein stated the following to the Governing Board members, according to the Board minutes:

> *Dr. Wallerstein noted that staff has begun to investigate the tar sand oil issue and will be performing source testing. Once a preliminary evaluation is complete, it will be presented to the Refinery Committee.*

We are looking forward to the South Coast Air Quality Management District (SCAQMD) completing this more detailed investigation and source testing of tar sands crude-by-rail to Los Angeles. (We list below some of the crucial issues this investigation must address.)

CBE also submitted a public records request for the application details of the Valero project last year but received very little information, because Valero argued that the application information was confidential business information. Most recently, we have heard from the District that Valero's proposed Wilmington rail project application[3] is apparently on hold, while Valero's related rail project in Benicia,

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[1] *Groups seek probe into low-grade crude shipments to L.A. refineries,* Louis Sahagan, LA Times, April 2, 2013, http://articles.latimes.com/2013/apr/02/local/la-me-0403-dirty-oil-20130403 .

[2] Testimony of Al Sattler and Jesse Marquez, Minutes, SCAQMD April 5th Board meeting, p. 18, http://www.aqmd.gov/hb/attachments/2011-2015/2013May/2013-May3-001.pdf

[3] Reuters Market News: June 5, 2013 – *"Valero Energy Corp plans to build a rail offloading facility that could take up to 60,000 barrels per day of cheap North American crude to replace pricey imports at its Los Angeles-area refinery, the*

Northern California, is undergoing review by the Bay Area air Quality Management District (BAAQMD), and the EIR for Valero's Benicia project in Northern California is scheduled to be released soon.[4] We would like to see some progress in investigating environmental, public and worker health and safety issues before Valero moves forward again.

Another project submitted by Phillips 66 has already undergone a first round of comments in response to a Negative Declaration published under California Environmental Quality Act (CEQA). CBE, along with Earth Justice, submitted comments (also attached) calling for a full Environmental Impact Report (EIR) on this project because of the significant environmental and public health impacts that the project has the potential to cause. While our comments documented that Phillips 66 has publicly acknowledged its plans to bring Canadian tar sands and North Dakota Bakken crude oil (a form of crude feedstock that raises its own set of environmental and safety concerns) into California by rail and ship, and specifically to the Los Angeles refinery, the negative declaration failed to mention that the proposed storage and crude unit modifications are needed to allow the processing of tar sands and Bakken crudes. Not only has Phillips 66 acknowledged in annual reports that it plans to bring these crudes to California refineries, but its corporate leaders have also stated plans to export refinery products to China, India, and Brazil.[5] This would mean that local Southern California communities would not only bear the impacts of gas and diesel production that would be used by Californians, but they would also bear the impacts from the added production for export (see our Phillips 66 comments).

We ask that the District exercise its authority to stop this trend in declining crude oil quality, in order to protect Californians, and specifically residents of the South Coast Air Basin, from the potentially devastating impacts of dangerous rail transport,[6] and related emissions increases, before it goes any further.

The District, of course, has the authority under California Health and Safety code to protect the public from potential harms to their health, and damage to property. See, Cal. Health and Safety Code § 40001(b) (District rules and regulations may provide for the prevention and abatement of air pollution causing discomfort or health risks to, or damage to the property of, a significant number of persons or class of persons). Indeed, the District also has a duty to address the increased risks of leaks, fires, and explosions at refineries, which can be caused by tar sands crudes as a result of their high sulfur content, and which can cause significant increases in harmful emissions, disproportionately burdening those communities that surround the refineries that will be receiving, processing and transporting this new feedstock.

California's electric power plants have been required to phase out dirtier fuel oil inputs in favor of natural gas, and are now phasing in renewables in place of natural gas. The authority to require these

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company said on Monday. Valero said it had applied for a building permit from the South Coast Air Quality Management District, the pollution regulator for Los Angeles-area refineries. The agency said it would take about 18 months to finish an environmental review, permitting and construction at the 78,000 bpd refinery in Wilmington, California." . . . "Valero spokesman Bill Day said the company wants to increase rail shipments of North American crude to its California refineries,which is cheaper than foreign imports or Alaskan crude. If approved, the facilities would offload both Canadian heavy and inland U.S. crude. http://www.ubs.wallst.com/ubs/mkt_story.asp?docKey=1329-L1N0EF0T3-1&first=0

[4] http://www.ci.benicia.ca.us/index.asp?SEC={FDE9A332-542E-44C1-BBD0-A94C288675FD}&Type=B_BASIC

[5] Phillips 66, 2012 Summary Annual Report, available at:
http://www.phillips66.com/EN/about/reports/Documents/Phillips-66-Summary-Annual-Report.pdf

[6] More oil spilled from trains in 2013 than in previous 4 decades, federal data show,
Read more here: http://www.kansascity.com/2014/01/20/4764674/more-oil-spilled-from-trains-in.html#storylink=cpy
http://www.kansascity.com/2014/01/20/4764674/more-oil-spilled-from-trains-in.html

feedstock changes is now taken for granted in California. In addition, just last year, the City of Los Angeles agreed to phase out coal feedstocks to its power plants. There has also been regulatory phaseout of other chemical feedstocks at oil refineries, such as anhydrous ammonia and hydrogen fluoride inputs, on the basis of safety.

Sulfur corrosion was in fact, a cause of the major 2012 Northern California Chevron Richmond refinery crude unit explosion according to the U.S. Chemical Safety Board (CSB). That explosion blew a massive toxic plume over the Bay Area, and narrowly missed killing 19 workers.[7]

At the January 9, 2014 meeting, District staff stated that it had inspected local refineries and didn't see corrosion. We would welcome more specific information about any standard protocols performed to identify such corrosion. We assume this was more of a general statement about visual inspection, since this type of sulfur corrosion analysis generally requires taking actual piping samples, such as that performed by the Chemical Safety Board.

In fact, the CSB did find sulfur corrosion in the Southern California Chevron El Segundo refinery's piping by cutting open piping. Further, Steelworkers testified at the CSB hearing April 19, 2013 that refinery sulfur corrosion is a statewide problem. Steelworkers also found California refineries have been steadily reducing maintenance,[8] which was another major factor in the Richmond explosion.

The CSB is now calling for new regulations to increase oil refinery safety in California refineries. The CSB website stated December 16, 2013,[9]

> **In Wake of Chevron 2012 Pipe Rupture and Fire in Bay Area CSB Draft Report Proposes Overhaul of Refinery Industry Regulatory System in California and Urges Adoption of the Safety Case Regime to Prevent Major Chemical Accidents**
>
> There are currently no federal or state regulatory requirements to apply these important preventative measures. The investigation team concluded that enhanced regulatory oversight with greater worker involvement and public participation are needed to improve petroleum refinery safety. . . .
>
> The existing California system of regulation can be significantly improved, the report concludes. Since 2010, the CSB has examined the extent to which a safety case regime would improve regulatory compliance and better prevent major accidents, both onshore and offshore.

Prevention and implementing inherently safer systems, were identified by the CSB as solutions. We need the District to evaluate inherently safer systems. In doing so, the District must examine the potential lives saved and increased safety by preventing a worsening of crude oil feedstock that will

[7] http://www.csb.gov/chevron-refinery-fire/.
[8] Improving Public and Worker Safety at Oil Refineries, Draft Report of the Interagency Working Group on Refinery Safety, Governor Jerry Brown, July 2013, http://www.calepa.ca.gov/Publications/Reports/2013/Refineries.PDF
[9] http://www.csb.gov/in-wake-of-chevron-2012-pipe-rupture-and-fire-in-bay-area-csb-draft-report-proposes-overhaul-of-refinery-industry-regulatory-system-in-california-and-urges-adoption-of-the-safety-case-regime-to-prevent-major-chemical-accidents/

increase the explosion hazard due to sulfur corrosion and hazards due to rail transport. In your white paper, we request that you include the following (although this is not a comprehensive set):

- Reporting of full crude oil slates including both domestic and imported crudes, at Southern California refineries for the last 5 years, including sulfur content, API gravity, and if possible metals content;
- A comparison of these crude oil slates to Canadian tar sands crude oils using crude oil assays including but not limited to sulfur content, API gravity and metals content;
- Evaluation of the risks of processing and transporting Canadian tar sands and Bakken North Dakota crude oils, as identified in our Phillips 66 comments to the District;
- Evaluation of diluents added for transport of tar sands crude;
- Evaluation of the U.S. Chemical Safety Board's recommendations on sulfur corrosion due to crude oil, and recommendations on implementing inherently safer systems, including avoiding the use of dangerous crude oils;
- Compilation of investigations done in the U.S. and Canada regarding increased rail accidents during crude oil transport;
- Identification of rail and pipeline connections to and near Southern California refineries.

The introduction of large volumes of tar sands and Bakken crude oils could endanger Southern California neighborhoods, and would result in an enormous step backward in California's work to fight climate change.

We appreciate the District's time and leadership in addressing the matters in this letter, and we welcome any questions or requests for more information. Please do not hesitate to contact us.

Sincerely,

Jack Eidt, Tar Sands Action, Southern California

Sherry Lear, concerned San Pedro community member

David Monkawa, California Nurses Association (CNA)

Alicia Rivera, Communities for a Better Environment (CBE)

April 2, 2013

Dr. Barry Wallerstein, Executive Officer
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765

Re: **Increasing Use of Tar Sands at Refineries Within the Region** – Urgent Need For Impacts Assessment

Dear Dr. Wallerstein:

On behalf of NRDC (Natural Resources Defense Council), and its more than 250,000 members in California, and Communities for a Better Environment (CBE), representing thousands of Californians, particularly those located in areas heavily impacted by oil refineries, we are writing to request your urgent action to evaluate the community health, air quality and climate impacts of increasing amounts of tar sands being refined in the region. While refineries in the region are subject to District regulations as well as Title V Clean Air Act permits through your agency, we are concerned that emissions increases may be occurring at refineries processing more dirty crude oils including Canadian tar sands and that these increases have not yet been fully accounted for.

It has come to our attention that oil companies are speeding up and expanding deliveries of one of the world's dirtiest crude oil products to California refineries. For example, Valero President Joe Gordon has publicly stated that the company has allocated rail cars to import what "could be 30,000 barrels a day" of Western Canada Select (WCS) or other diluted bitumen product to its Wilmington plant. This would more than double tar sands deliveries into the Los Angeles area, which were roughly 29,000 barrels for all of 2012 according to the Energy Information Administration. Phillips 66 and Tesoro have also expressed an interest in increasing tar sands shipments into California in recent weeks.

The increasing use of very high sulfur, low-quality crude oils in California refineries presents a major hazard to the surrounding communities that are already facing disproportionately high pollution levels. Refining tar sands will create more local air pollution due to the more intensive processing required for lower quality crude oil, which will lead to increased health consequences for residents near refineries. We also expect increases in carbon pollution, which will make it harder for the state to meet voter-approved targets, if greater quantities of dirtier crude oil sources like tar sands are used in California. Finally, the highly corrosive nature of tar sands will increase the likelihood for spills and accidents, posing direct safety risks and exposure to increased toxic emissions for both plant workers and the surrounding community. Thus, we are calling on the South Coast Air Quality Management District to use all of its regulatory authority to prevent any increase in air pollution due to increased heavy crude utilization by District refineries and conduct a rigorous evaluation of all the health and safety, air quality and climate impacts of increasing use of unconventional, extra heavy crude oils including Canadian tar sands.

www.nrdc.org

111 Sutter Street, 20th Floor
San Francisco, CA 94104
TEL 415 875-6100 FAX 415 875-6161

NEW YORK · WASHINGTON, DC · LOS ANGELES

We encourage the South Coast Air Quality Management District to be a leader in protecting the health and welfare of its refinery-adjacent residents.

We appreciate your immediate attention to this matter.

Sincerely,

Diane Bailey, Senior Scientist, NRDC

Adrian Martinez, Attorney, NRDC

Alicia Rivera, Wilmington Community Organizer, CBE

Julia May, Senior Scientist CBE

BOARD MEETING DATE: December 5, 2014 AGENDA NO. 21

REPORT: Lead Agency Projects and Environmental Documents Received by the SCAQMD

SYNOPSIS: This report provides, for the Board's consideration, a listing of CEQA documents received by the SCAQMD between October 1, 2014 and October 31, 2014, and those projects for which the SCAQMD is acting as lead agency pursuant to CEQA.

COMMITTEE: Mobile Source, November 21, 2014, Reviewed

RECOMMENDED ACTION:
Receive and file.

Barry R. Wallerstein, D.Env.
Executive Officer

EC:LT:SN:MK:JB:AK

CEQA Document Receipt and Review Logs (Attachments A and B) – Each month, the SCAQMD receives numerous CEQA documents from other public agencies on projects that could adversely affect air quality. A listing of all documents received and reviewed during the reporting period of October 1, 2014, through October 31, 2014 is included in Attachment A. A list of active projects from previous reporting periods for which SCAQMD staff is continuing to evaluate or has prepared comments is included as Attachment B.

The Intergovernmental Review function, which consists of reviewing and commenting on the adequacy of the air quality analysis in CEQA documents prepared by other lead agencies, is consistent with the Governing Board's 1997 Environmental Justice Guiding Principles and Initiative #4. Consistent with the Environmental Justice Program Enhancements for FY 2002-03 approved by the Board in September 2002, each of the attachments notes those proposed projects where the SCAQMD has been contacted regarding potential air quality-related environmental justice concerns. The SCAQMD has established an internal central contact to receive information on projects with potential air quality-related environmental justice concerns. The public may contact the

SCAQMD about projects of concern by the following means: in writing via fax, email, or standard letters; through telephone communication; as part of oral comments at SCAQMD meetings or other meetings where SCAQMD staff is present; or submitting newspaper articles. The attachments also identify for each project the dates of the public comment period and the public hearing date, as reported at the time the CEQA document is received by the SCAQMD. Interested parties should rely on the lead agencies themselves for definitive information regarding public comment periods and hearings as these dates are occasionally modified by the lead agency.

At the January 6, 2006 Board meeting, the Board approved the Workplan for the Chairman's Clean Port Initiatives. One action item of the Chairman's Initiatives was to prepare a monthly report describing CEQA documents for projects related to goods movement and to make full use of the process to ensure the air quality impacts of such projects are thoroughly mitigated. In response to describing goods movement CEQA documents, Attachments A and B are organized to group projects of interest into the following categories: goods movement projects; schools; landfills and wastewater projects; airports; and general land use projects, etc. In response to the mitigation component, guidance information on mitigation measures were compiled into a series of tables relative to: off-road engines; on-road engines; harbor craft; ocean-going vessels; locomotives; fugitive dust; and greenhouse gases. These mitigation measure tables are on the CEQA webpages portion of the SCAQMD's website. Staff will continue compiling tables of mitigation measures for other emission sources including airport ground support equipment, etc.

As resources permit, staff focuses on reviewing and preparing comments for projects: where the SCAQMD is a responsible agency; that may have significant adverse regional air quality impacts (e.g., special event centers, landfills, goods movement, etc.); that may have localized or toxic air quality impacts (e.g., warehouse and distribution centers); where environmental justice concerns have been raised; and those projects for which a lead or responsible agency has specifically requested SCAQMD review. If the SCAQMD staff provided written comments to the lead agency as noted in the column "Comment Status", there is a link to the "SCAQMD Letter" under the Project Description. In addition, if the SCAQMD staff testified at a hearing for the proposed project, a notation is provided under the "Comment Status." If there is no notation that the SCAQMD staff testified, then staff did not provide testimony at a hearing for the proposed project.

During the period October 1, 2014 through October 31, 2014, the SCAQMD received 99 CEQA documents. Of the total of 109 documents listed in Attachments A and B:

- 31 comment letters were sent;
- 11 documents were reviewed, but no comments were made;
- 23 documents are currently under review;
- 3 documents did not require comments (e.g., public notices, plot plans, Final Environmental Impact Reports);
- 1 documents were not reviewed; and
- 40 were screened without additional review.

Copies of all comment letters sent to lead agencies can be found on the SCAQMD's CEQA webpage at the following internet address: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency/comment-letter-year-2014.

In addition, SCAQMD staff has been working on a Warehouse Truck Trip Study to better quantify trip rates associated with local warehouse and distribution projects, as truck emissions represent more than 90 percent of air quality impacts from these projects. Draft final results for the Warehouse Truck Trip Study are completed and are lower than current SCAQMD recommended truck trip rates in the California Emissions Estimator Model (CalEEMod).

SCAQMD Lead Agency Projects (Attachment C) – Pursuant to CEQA, the SCAQMD periodically acts as lead agency for stationary source permit projects. Under CEQA, the lead agency is responsible for determining the type of CEQA document to be prepared if the proposal is considered to be a "project" as defined by CEQA. For example, an Environmental Impact Report (EIR) is prepared when the SCAQMD, as lead agency, finds substantial evidence that the proposed project may have significant adverse effects on the environment. Similarly, a Negative Declaration (ND) or Mitigated Negative Declaration (MND) may be prepared if the SCAQMD determines that the proposed project will not generate significant adverse environmental impacts, or the impacts can be mitigated to less than significance. The ND and MND are written statements describing the reasons why proposed projects will not have a significant adverse effect on the environment and, therefore, do not require the preparation of an EIR.

Attachment C to this report summarizes the active projects for which the SCAQMD is lead agency and is currently preparing or has prepared environmental documentation. Through the end of October, the SCAQMD certified one permit project on October 10, 2014. As noted in Attachment C, through the end of October 2014, the SCAQMD continued working on the CEQA documents for ten active projects.

Through the end of October 2014, SCAQMD staff has been responsible for preparing or having prepared CEQA documents for eleven permit application projects.

Attachments

A. Incoming CEQA Documents Log
B. Ongoing Active Projects for Which SCAQMD Has or Will Conduct a CEQA Review
C. Active SCAQMD Lead Agency Projects

ATTACHMENT A* INCOMING CEQA DOCUMENTS LOG OCTOBER 1, 2014 TO OCTOBER 31, 2014

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS
Goods Movement **LAC141003-05** Mitsubishi Cement (MCC Cement Facility) #	The proposed project consists of modifications to the existing cement import facility located at 1150 Pier F Avenue. The project would include installation of a vessel at-berth emission control system, construction of additional cement storage and truck loading silos on an adjacent lot, and upgrades to ship unloading equipment and other landside structures. Comment Period: 10/3/2014 - 11/18/2014 Public Hearing: 10/22/2014	Draft Environmental Impact Report	Port of Long Beach	Document under review as of 10/31/14
Goods Movement **LAC141007-04** Berths 212-224 (YTI) Container Terminal Improvements Project #	The proposed project consists of improving the container-handling efficiency of the existing YTI Terminal at the Port to accommodate the projected fleet mix of larger container vessels (up to 13,000 TEUs) that are anticipated to call at the YTI Terminal through 2026. The proposed Project consists of deepening two existing berths (Berths 217–220 and Berths 214–216), which would add an additional operating berth to the YTI Terminal, extending the 100-foot gauge crane rail to Berths 217–220, adding a single operational rail track to the Terminal Island Container Transfer Facility (TICTF) on-dock rail, modifying and replacing cranes, and constructing backland improvements. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/feiryti212-224.pdf http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/ytifeireis103014.pdf Comment Period: N/A Public Hearing: 11/7/2014	Final Environmental Impact Report	Port of Los Angeles	SCAQMD staff commented 10/30/2014 SCAQMD Staff Testified 10/16/14
Goods Movement **LAC141023-08** Avalon Freight Services Relocation Project	The proposed project consists of landside and waterside improvements at Berth 95, including the construction of a 20,000 square-foot warehouse/office space in the existing parking structure at Berth 95. Waterside improvements would be made to accommodate one new barge and tug boat, and one new landing craft. The waterside improvements include the installation of approximately 22 pilings to secure three new floats as well as some minor modifications to the existing boat launch ramp. Comment Period: 10/23/2014 - 11/22/2014 Public Hearing: N/A	Draft Negative Declaration	Port of Los Angeles	Document under review as of 10/31/14
Goods Movement **LAC141024-03** 226-236 (Everport) Container Terminal Improvements Project #	The proposed project consists of the construction and operation of terminal improvements within and adjacent to the Everport Container Terminal. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/nopberth226-236.pdf Comment Period: 10/24/2014 - 11/24/2014 Public Hearing: N/A	Notice of Preparation	Port of Los Angeles	SCAQMD staff commented 10/31/2014
Warehouse & Distribution Centers **SBC141003-06** Prologis	The proposed project consists of developing four warehouse distribution facilities totaling 1,529,498 square feet with building sizes that range from 160,106 to 862,035 square feet on 84 acres. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/feirprologis.pdf Comment Period: N/A Public Hearing: N/A	Revised Final Environmental Impact Report	City of Moreno Valley	SCAQMD staff commented 10/10/2014

**Sorted by Land Use Type (in order of land uses most commonly associated with air quality impacts), followed by County, then date received.*

- Project has potential environmental justice concerns due to the nature and/or location of the project.

Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency

ATTACHMENT A
INCOMING CEQA DOCUMENTS LOG
OCTOBER 1, 2014 TO OCTOBER 31, 2014

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS
Warehouse & Distribution Centers **SBC141024-02** Modular Logistics Center	The proposed project consists of the redevelopment of an underutilized 50.84 gross-acre property. The redevelopment process would involve the demolition and removal of existing industrial buildings and associated improvements from the subject property, grading and preparation for the redevelopment, and construction and operation of a logistics warehouse structure containing 1,109,378 square feet of building space and 26 loading bays. Comment Period: 10/24/2014 - 12/8/2014 Public Hearing: N/A	Draft Environmental Impact Report	City of Moreno Valley	Document under review as of 10/31/14
Warehouse & Distribution Centers **SBC141030-01** Goodman Logistics Center	The proposed project consists of constructing a new business park development totaling approximately 1,230,585 square feet of floor area. The project will involve the construction of three new concrete tilt-up industrial warehouse buildings. Comment Period: 10/30/2014 - 11/28/2014 Public Hearing: N/A	Notice of Preparation	City of Santa Fe Springs	Document under review as of 10/31/14
Airports **ALL141028-01** Southern California Optimization of Airspace and Procedures in the Metropolex (SoCal OAPM) Project Briefings Notifications	The proposed project consists of changes in aircraft flight paths and/or altitudes in certain areas, but would not require any ground disturbance nor increase the number of aircraft operations within the Southern California Metroplex area. Comment Period: N/A Public Hearing: N/A	Initial Project Consultation	U.S. Department of Transportation	Document does not require comments
Industrial and Commercial **LAC141022-02** Irwindale Olive Pit	See Record LAC140815-05. SCAQMD Staff provided comments on the DEIR on 8/15/14. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/september/deirolive.pdf. The City of Baldwin Park provided SCAQMD with their comments on the Draft EIR. Comment Period: N/A Public Hearing: N/A	Comments to Draft EIR.	City of Irwindale	Document screened - No further review conducted
Industrial and Commercial **RVC141016-10** Mt. San Jacinto Winter Park Authority Valley Station Zip Line Project	The proposed project consists of constructing a recreational zip line facility adjacent to the valley station employee parking lot at the Palm Springs Aerial Tramway. The project would consist of a take-off platform, and include a hillside drop-point anchored into native rock with an elevation gain of approximately 106.7 feet and horizontal distance of approximately 500+ feet. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/ndvalleyzip.pdf Comment Period: 10/22/2014 - 11/10/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	Mt. San Jacinto Winter Park Authority	SCAQMD staff commented 10/30/2014
Industrial and Commercial **SBC141014-03** Perricone Juices	The proposed project consists of a site plan review of a 20,604 square-foot addition at an existing juice processing facility. Comment Period: 10/10/2014 - 10/31/2014 Public Hearing: N/A	Initial Project Consultation	City of Beaumont	Document screened - No further review conducted

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Industrial and Commercial **SBC141021-03** MA14117	The proposed project consists of the construction of a new 32,800 square-foot industrial building to be used for manufacturing concrete, gypsum, plaster and mineral products. Outside storage of finished material is also being proposed. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/nopma14117.pdf Comment Period: 10/21/2014 - 10/28/2014 Public Hearing: N/A	Initial Project Consultation	City of Jurupa Valley	SCAQMD staff commented 10/30/2014
Industrial and Commercial **SBC141021-06** MA14126 (Site Development Permit No. 31436)	The proposed project consists of two new industrial buildings. Building one will be 607,140 square feet and building two will be 518,960 square feet. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/warehouse14126.pdf Comment Period: N/A Public Hearing: N/A	Initial Project Consultation	City of Jurupa Valley	SCAQMD staff commented 10/30/2014
Waste and Water-related **LAC141002-08** AAD Distribution and Dry Cleaning Services, Inc. Proposed Consent	The proposed project consists of the Second Settlement and Consent Decree regarding the former AAD Distribution and Dry Cleaning Services, Inc located in Vernon. The proposed Consent Decree resolves claims against Archipel, Inc. and related companies for their contributions to contamination at the site as a result of sending hazardous waste to the AAD facility. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dtscaaddry.pdf Comment Period: 9/12/2014 - 10/13/2014 Public Hearing: N/A	Public Notice	Department of Toxic Substances Control	SCAQMD staff commented 10/15/2014
Waste and Water-related **LAC141003-02** Royal Recycling and Transfer Facility	The proposed project consists of permitting the operation of a materials recovery facility. The proposed use will occupy a number of existing buildings that have a total floor area of 146,600 square feet. In addition, a new "receive building" consisting of 39,500 square feet will be constructed. Total floor area of the existing and new buildings will be 186,100 square feet. Comment Period: 10/2/2014 - 11/17/2014 Public Hearing: N/A	Draft Environmental Impact Report	City of Paramount	Document under review as of 10/31/14
Waste and Water-related **LAC141007-03** Former Southland Steel Facility 5959-6161 Alameda Avenue, Huntington Park	The proposed project consists of the Final Response Plan for the Former Southland Steel Facility. This document consists of responses to comments. Comment Period: N/A Public Hearing: N/A	Response to Comments	Department of Toxic Substances Control	Document screened - No further review conducted
Waste and Water-related **LAC141007-05** Line 63 Re-Route Project	The proposed project consists of a 2.27-mile long re-route of a segment of a petroleum pipeline (line 63) and approximately 2,000 linear feet of Horizontal Directional Drilling. The new locations would avoid a concentration of geologic hazards located along the existing Line 63 alignment, within a deep canyon between Fisher Springs Road and the Old Ridge Route. The proposed action would relocate the pipeline into a previously disturbed pipeline corridor, along an existing oil pipeline. The re-route alignment is proposed based on the presence of fewer geologic hazards, accessibility and constructability of the route. Comment Period: N/A Public Hearing: N/A	Draft Environmental Assessment	United States Department of Agriculture	Document reviewed - No comments sent

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Waste and Water-related **LAC141007-08** Ascon Landfill Site	The proposed project consists of considering an inclusion of an additional truck haul route needed to address short-term traffic impacts previously analyzed in the Draft EIR. Comment Period: 10/6/2014 - 11/21/2014 Public Hearing: 11/6/2014	Community Notice	Department of Toxic Substances Control	Document reviewed - No comments sent
Waste and Water-related **LAC141008-02** Renu Plating Company, Inc. Site, Los Angeles, California	The proposed project consists of a proposed Consent Decree with the Renu Plating Company, Inc. The proposed Consent Decree resolves DTSC's claims against Lichtbachs under the Comprehensive Environmental Response, Compensation, and Liability Act. The Litchtbachs owned the Site from approximately 1980 to 1986 and were named as defendants in DTSC's lawsuit filed to recover DTSC's costs of investigating and cleaning up hazardous substances released at the Site. Comment Period: 10/8/2014 - 11/10/2014 Public Hearing: N/A	Community Notice	Department of Toxic Substances Control	Document screened - No further review conducted
Waste and Water-related **LAC141009-06** CUP No. 6222, 3420, 3500, 4401 and 4500	The proposed project consists of allowing the repair and replacement of facilities within the Arroyo Seco Canyon Area that were damaged or destroyed by Station Fire-related events of 2009. Comment Period: 10/9/2014 - 11/8/2014 Public Hearing: 11/19/2014	Draft Mitigated Negative Declaration	City of Pasadena	Document screened - No further review conducted
Waste and Water-related **LAC141009-08** California School for the Deaf - Riverside Draft Removal Action Workplan (RAW)	The proposed project consists of the RAW clean up plan of contaminated soil at the California School for the Deaf - Riverside site. Lead, arsenic, and pesticides were found at elevated levels in soil on the Site. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dtscrawschofdeafrivdoc.pdf Comment Period: 10/9/2014 - 11/8/2014 Public Hearing: N/A	Community Notice	Department of Toxic Substances Control	SCAQMD staff commented 10/21/2014
Waste and Water-related **LAC141014-05** Santa Susana Field Laboratory Area IV	This document consists of a Class 1 Modification Request. The proposed project consists of a Class 1 permit modification for each facility to request DTSC approval of the operator transfer from Boeing to North Winds Inc. (NWI). The modification request included revised Part A forms with the name and contact information of the new operator NWI. Comment Period: N/A Public Hearing: N/A	Other	Department of Energy	Document screened - No further review conducted

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Waste and Water-related **LAC141016-08** Saugus Industrial Center, Former Keysor-Century Corporation Facility - Draft Remedial Action Plan	The proposed project consists of a Draft Remedial Action Plan for the clean up of soil and groundwater at the Saugus Industrial Center, formerly known as the Keysor-Century Corporation Facility. Comment Period: 10/15/2014 - 11/17/2014 Public Hearing: N/A	Community Notice	Department of Toxic Substances Control	Document under review as of 10/31/14 Fact Sheet
Waste and Water-related **LAC141017-05** Santa Anita Stormwater Flood Management and Seismic Strengthening Project	The proposed project consists of modifying existing flood management and water conservation facilities along the Santa Anita Canyon Watershed, including the Santa Anita Dam, the Santa Anita Headworks, the Wilderness Park Culbert Crossing, and the Santa Anita Debris Dam. The improvements would: 1) reduce flood risk to downstream communities; 2) enhanced sustainability of the local water supply and increased recharge to the groundwater basin by over 500 acre-feet per year; 3) improve all-weather access to the Arcadia Wilderness Park by constructing a new culvert crossing. Comment Period: 10/17/2014 - 12/4/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	County of Los Angeles	Document screened - No further review conducted
Waste and Water-related **LAC141021-05** Devil's Gate Reservoir Sediment Removal and Management Project	The proposed project consists of removing sediment from Devil's Gate Reservoir to restore capacity and to protect the dam and its valves to reduce the risk of flooding in the communities located downstream. This effort will include removal of approximately 2.9 million cubic yards of existing excess sediment in the reservoir in addition to any additional sediment that accumulates during construction. Comment Period: N/A Public Hearing: 11/12/2014	Response to Comments	Los Angeles County Flood Control District	Document screened - No further review conducted
Waste and Water-related **LAC141021-11** Soil Remediation at Berths 171-173	The proposed project consists of soil remediation at Berths 171-173. Comment Period: N/A Public Hearing: 11/20/2014	Notice of a Public Hearing	Port of Los Angeles	Document screened - No further review conducted
Waste and Water-related **LAC141021-12** F.E. Weymount Treatment Plant Improvement Program	The proposed project consists of upgrading existing and/or constructing new facilities at the Weymouth Plan to accommodate the plant's maximum operating capacity and update the overall facility. The project would involve rehabilitating and refurbishing aging treatment structures, upgrading systems to improve treatment processes, enhancing worker safety, reducing carbon emissions with renewable energy, improving stormwater management, and ensuring compliance with recent legislation pertaining to the State Drinking Water Act. Comment Period: 10/21/2014 - 12/6/2014 Public Hearing: N/A	Draft Environmental Impact Report	Metropolitan Water District of Southern California	Document under review as of 10/31/14

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Waste and Water-related **LAC141022-03** Irwindale Material Recovery Facility Transfer Station	See Record LAC140808-02. SCAQMD staff provided comments on DEIR on 8/8/14. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/september/deirirwinmrf.pdf The City of Baldwin Park provided SCAQMD with their comments on the Draft EIR. Comment Period: N/A Public Hearing: N/A	Comments to Draft EIR	City of Irwindale	Document screened - No further review conducted
Waste and Water-related **LAC141023-09** Cleanup Plan for Groundwater at the KB Gardena Building, LLC Site in Gardena	The proposed project consists of a Removal Action Workplan to clean up the groundwater at the KB Gardena building site. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dtscrawkbgardena.pdf Comment Period: 10/24/2014 - 11/24/2014 Public Hearing: N/A	Community Notice	Department of Toxic Substances Control	SCAQMD staff commented 10/31/2014
Waste and Water-related **RVC141002-09** Semi-Annual Depth to Groundwater Measurements	The proposed project consists of a Class 1 permit modification to the Department of Toxic Substances Control. The modification will allow for transitioning from quarterly measurements. This modification will not affect any of the current operations at the facility. Comment Period: N/A Public Hearing: N/A	Public Notice	Department of Toxic Substances	Document screened - No further review conducted
Waste and Water-related **RVC141030-03** Remedial Action Plan for Laborde Canyon (Lockheed Propulsion - Beaumont No. 2)	The proposed project consists of the cleanup on the Laborde Canyon Site, also known as Lockheed Propulsion - Beaumont No. 2, located in Riverside County. The proposed cleanup includes remediation of contaminated soil and groundwater. Comment Period: 10/30/2014 - 12/4/2014 Public Hearing: N/A	Notice of Preparation	Department of Toxic Substances Control	Document under review as of 10/31/14
Waste and Water-related **SBC141017-02** Mid-Valley Landfill Permit Revision Project	The proposed project consists of modifying the landfill operation hours to allow for 24-hour per day operations, Monday and Saturday. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/nopmidvalley.pdf Comment Period: 10/17/2014 - 11/13/2014 Public Hearing: N/A	Notice of Preparation	County of San Bernardino	SCAQMD staff commented 10/24/2014
Waste and Water-related **SBC141029-01** Lake Gregory Regional Park (Houston Creek), Crestline, CA 92325	The proposed project consists of meeting state mandated dam seismic safely standards that require the ability to lower the water level of a reservoir by half capacity over a period of seven days. Once the project is built, the improved outlet works would be adequately maintained, easily accessible, and allow for the management of water levels as required by the State's Department of Water Resources Division of Safety of Dams. Comment Period: 10/29/2014 - 12/29/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	County of San Bernardino	Document reviewed - No comments sent

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Utilities **LAC141016-03** ENV-2014-2730/ 4977 W. Washington Blvd; West Adams-Baldwin Hills-Leimert	The proposed project consists of the construction, use and maintenance of a wireless telecommunication facility consisting of 12 panel antennas on a 50-foot high monopine structure and an approximately 350 square-foot at-grade equipment cabinet. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/nd4977wwashing.pdf Comment Period: 10/16/2014 - 11/5/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 10/30/2014
Utilities **LAC141023-05** ENV-2014-2492/ 505 S. San Pedro St.: Central City	The proposed project consists of a permit to install, use and maintain a new unmanned wireless telecommunication facility comprised of 11 panel antennas, 24 remote radio units, three GPS antennas, with supportive equipment, all on the rooftop of an existing 75-foot tall residential building. Comment Period: 10/23/2014 - 11/12/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document under review as of 10/31/14
Transportation **LAC141017-01** Project Nos. 1043, 1492 and 1493	The proposed project consists of improvements to a 1.75-mile segment of Carson Street between I-405 and I-110 implementing the Carson Street Master Plan. Majority of the improvements on Carson Street will be within the public right of way including, widening of sidewalks, installing on traffic signals, installing fiber optic conduit, modifications to medians and driveways, re-pavement of the travel lanes, modifications to on-street parking, decorative crosswalks, addition of landscaping and irrigation waterline, and street furniture such as monuments, pedestrian and auto oriented lights and art pieces, bike racks, benches, wayfaring signs bus shelters, trash receptacles, etc.	Draft Negative Declaration	City of Carson	Document screened - No further review conducted
Transportation **ORC141007-02** Park Avenue Bridge Replacement Project	The proposed project consists of demolition of the existing Park Avenue Bridge and construction of an improved seismically-reinforced bridge over the Grand Canal. The new bridge would include 11-foot vehicle lanes, six-foot raised sidewalks, and ADA compliant switchback ramps. Comment Period: 10/6/2014 - 11/5/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Newport Beach	Document screened - No further review conducted
Transportation **RVC141010-01** Squaw Mountain Road Bridge Repair Report	The proposed project consists of repairs to lining of the channel bottom below the bridge with concrete, connecting the concrete-lined channel to the existing bridge abutment, placing 1/4-ton of rock that will be used to stablize streambed on the upstream and downstream sides of the concrete-lined portion of the channel, and installing riprap slope protection on the northwest slope. An existing asphalt access road would be extended approximately 40 feet. Comment Period: 10/7/2014 - 11/6/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	County of Riverside	Document screened - No further review conducted

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Transportation **SBC141007-07** High Desert Corridor Project	The proposed project consists of a Strategic Multipurpose corridor that might include highway, toll way, High Speed Rail, bikeway and green energy production/transmission elements extending 63 miles between State Route 14 in Los Angeles County and San Bernardino County. Comment Period: 10/7/2014 - 12/2/2014 Public Hearing: 12/2/2014	Notice of a Public Hearing	California Department of Transportation	Document screened - No further review conducted
Institutional (schools, government, etc.) **LAC141010-03** Heritage Castle Museum	The proposed project would consist of the Heritage Castle Museum that would occupy a 2,690 square-foot portion of the existing Harden Estate gatehouse. An existing barn will be removed from the grounds. All other alterations to the structure and site are proposed to occur inside of the existing gatehouse building. Comment Period: 10/10/2014 - 11/10/2014 Public Hearing: 10/28/2014	Notice of Availability of a Draft Mitigated Negative Declaration	City of Rancho Palos Verdes	Document screened - No further review conducted
Institutional (schools, government, etc.) **LAC141014-01** Mandarin and English Dual-Language Immersion Elementary School Project at Mark Twain Middle School	The proposed project consists of a new classroom building consisting of approximately 15 classrooms, a multi-purpose room, and administrative and support spaces; new food services and lunch shelter facilities; designated elementary and kindergarten play areas; designated student drop-off and parking areas; and modifications to approximately eight existing portable classrooms. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/nopmandengsch.pdf Comment Period: 10/14/2014 - 11/12/2014 Public Hearing: N/A	Notice of Preparation	Los Angeles Unified School District	SCAQMD staff commented 10/21/2014
Institutional (schools, government, etc.) **LAC141021-08** Malibu Institute	The proposed project consists of reconfiguring lot lines of 29 existing lots to create a total of seven lots over the 650-acre project site. Comment Period: N/A Public Hearing: 11/19/2014	Notice of a Public Hearing	County of Los Angeles	Document screened - No further review conducted
Institutional (schools, government, etc.) **LAC141021-13** Long Beach Courthouse Demolition Project	The proposed project consists of demolishing the former Long Beach Courthouse building and would entail the removal of reinforced concrete, structural steel, siding, glass, and other building materials from the project site. Comment Period: 10/14/2014 - 12/1/2014 Public Hearing: N/A	Draft Environmental Impact Report	City of Long Beach	Document under review as of 10/31/14

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Institutional (schools, government, etc.) **LAC141022-01** Los Angeles Street Civic Building Project	The proposed project consists of reactivating the existing Parker Center Property to provide office space for City of Los Angeles employees. Three potential build alternatives are considered and are as follows: Rehabilitation with various improvements; Partial Demolition Rehabilitation, and Addition, which includes rehabilitation of majority of the building combined with an expansion of 522,255 square feet; and Demolition and Build, which includes full demolition and construction of 753,753 square feet. Comment Period: N/A Public Hearing: 10/28/2014	Response to Comments	City of Los Angeles	Document does not require comments
Institutional (schools, government, etc.) **ORC141007-01** Mater Dei High School Parking Structure and School Expansion Project	The proposed project consists of constructing a three-level parking structure east of the school's existing campus and a two-story classroom building within the boundaries of the existing campus. No change to the school's existing operations would occur; however, maximum student enrollment is proposed to be increased from 2,200 students to 2,500 students. The addition of the proposed parking structure would increase the size of the campus from approximately 21 acres to 25 acres. Comment Period: 10/6/2014 - 11/19/2014 Public Hearing: N/A	Draft Environmental Impact Report	City of Santa Ana	Document screened - No further review conducted
Medical Facility **LAC141030-02** Development Plan Approval Case No. 881 and Environmental Document	The proposed project consists of the development plan approval and construction of an approximately 35,076 square-foot three-story Medical Office Building for outpatient uses, and appurtenant improvements, on the 2.327-acre property. Comment Period: N/A Public Hearing: 11/10/2014	Notice of a Public Hearing	City of Santa Fe Springs	Document does not require comments
Retail **LAC141002-02** ENV-2013-2369/ 12625-33 N. Glenoaks Blvd. and 14071 W. Hubbard St; Sylmar	The proposed project consists of a new gas station in conjunction with Food 4 Less grocery store to include (1) 92 feet x 43 feet fueling canopy, (1) 173 square-foot kiosk with restroom, five gas dispensers, two underground storage tanks and associated fueling components, trash enclosure, monument sign and additional signage on fueling canopy and kiosk, and an air/water unit. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dmndglendoaks.pdf Comment Period: 10/2/2014 - 11/3/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 10/10/2014
Retail **LAC141002-03** ENV-2014-2513/ 13673-13689 West Foothill Boulevard, Sylmar	The proposed project consists of the demolition of one-story, commercial building and the construction of a 2,240 square-foot Starbucks Coffee and a 5,500 square-foot building, for a total of 7,740 square feet. Comment Period: 10/2/2014 - 11/3/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted

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Retail **LAC141002-07** ENV-2014-1277/ 5600, 5602 W. Hollywood Blvd. and 1669, 1671, 1673, 1675, 1677, 1679 and 1681 N. St. Andrews Pl.; Hollywood	The proposed project consists of the construction, use and maintenance of a boutique hotel with 80 guestrooms and 867 square feet of restaurant space. The new hotel will be six-stories, 75 feet in height and consists of 26,671 square feet of floor area on an approximately 9,514 square-foot site. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dmndhollywood.pdf Comment Period: 10/2/2014 - 11/3/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 10/10/2014
Retail **LAC141029-02** Valencia Boulevard Gas Station	The proposed project consists of the construction of a new fueling station and 6,000 square-foot commercial building, consisting of a convenience store, restaurant, and office. Comment Period: 10/28/2014 - 11/18/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Santa Clarita	Document under review as of 10/31/14
General Land Use (residential, etc.) **LAC141001-04** 550 N. Third Street Project	The proposed project consists of constructing a mixed-use development with 97 apartment units and 1,526 square feet of retail space in a single structure consisting of six stories over a subterranean and semi-subterranean parking structure. Comment Period: 10/1/2014 - 10/14/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Burbank	Document reviewed - No comments sent
General Land Use (residential, etc.) **LAC141002-01** ENV-2011-1535-REC-1/ 1019-2068 South La Cienega Boulevard & 1036-1046 Corning Street; Wilshire	The proposed project consists of allowing the continued use and operation of an existing synagogue and school together with the expansion of accessory school uses for the addition demolition of existing Pressmen Early Childhood Center and five residential buildings on the site and the construction of a new two-story, 21,000 square-foot building with eight classrooms with an 8,500 square-foot outdoor play area and a surface parking lot with 27 parking spaces. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dmndenv20111535.pdf Comment Period: 10/2/2014 - 10/22/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 10/9/2014
General Land Use (residential, etc.) **LAC141002-04** ENV-2014-2360/ 6939 N. Van Nuys Blvd.; Van Nuys-North Sherman Oaks	The proposed project consists of expanding an existing banquet hall into the adult day care facility and the construction of a two-story, 4,280 square-foot addition to the existing 10,476 square-foot building; resulting in a 14,756 square-foot banquet hall. Comment Period: 10/2/2014 - 10/22/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted

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General Land Use (residential, etc.) **LAC141002-05** ENV-2010-3311/ 3460 N. Beverly Glen Blvd; Sherman Oaks-Studio City-Toluca Lake-Caguenga Pass	The proposed project consists of a Preliminary Parcel Map to subdivide a circular shaped property into three lots for the construction and use of the single-family homes on a 3.29-acre vacant site. Comment Period: 10/2/2014 - 10/22/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document under review as of 10/31/14
General Land Use (residential, etc.) **LAC141002-06** ENV-2014-930/ 2754 N. Rinconia Dr.; Hollywood	The proposed project consists of an addition of 4,447 square feet to an existing 1,154 square-foot single-family dwelling on a 1/4-acre lot. Comment Period: 10/2/2014 - 10/22/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141003-01** El Serano Park Improvement Project	The proposed project consists of replacing the existing Clubhouse and the adjacent paved area with several new recreational facilities within El Serano Recreation Center and Park. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/nopelsereno.pdf Comment Period: 10/2/2014 - 11/3/2014 Public Hearing: N/A	Notice of Preparation	City of Los Angeles	SCAQMD staff commented 10/10/2014
General Land Use (residential, etc.) **LAC141003-04** La Plaza Cultura Village Project	The proposed project consists of a lease agreement between the County and the La Plaza de Cultura y Artes Foundation to permit the development and use of a mixed-use project. The project would establish a mixed-use, transit-oriented infill development totaling approximately 425,000 square feet, including up to 345 residential units (for lease) with 20 percent of the units reserved as affordable units, together with up to 55,000 square feet of visitor-serving retail including, but not limited to, a restaurant, a café, other food services, and a "commissary" or shared kitchen space for culinary demonstrations and use by small businesses. Comment Period: N/A Public Hearing: N/A	Final Environmental Impact Report	County of Los Angeles	Document reviewed - No comments sent
General Land Use (residential, etc.) **LAC141007-06** San Bernardino Residential Town-Homes (Bella Vista Specific Plan)	The proposed project consists of demolishing existing buildings and accessory structures at the project site, The proposed development would provide 135 town-home units within the 6.49-acre site. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dmndbellavista.pdf Comment Period: 10/9/2014 - 10/28/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of West Covina	SCAQMD staff commented 10/16/2014
General Land Use (residential, etc.) **LAC141009-01** ENV-2014-856/ 1430 N. Eaton Terrace; Northeast Los Angeles	The proposed project consists of the construction, use and maintenance of a new 2,476 square-foot single-family dwelling with an attached 237 square-foot, two-car garage. Comment Period: 10/9/2014 - 11/10/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted

- Project has potential environmental justice concerns due to the nature and/or location of the project.

Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency

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SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS
General Land Use (residential, etc.) **LAC141009-02** ENV-2014-2433/ 1531 West Sunset Blvd.; Silver Lake-Echo Park-Elysian Valley	The proposed project consists of expanding an existing restaurant from 685 square feet to 2,031 square feet. Comment Period: 10/9/2014 - 10/29/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141009-03** ENV-2014-200/ 1550 West 8th Street; Westlake	The proposed project consists of the demolition of the existing 11,100 two-story square-foot building and the construction of a 45,770 four-story square-foot building and removal of the adjacent surface parking lot. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/nd1550w8th.pdf Comment Period: 10/9/2014 - 10/29/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 10/30/2014
General Land Use (residential, etc.) **LAC141009-04** ENV-2014-2487/ 7734 N. Varna Ave.; Sun Valley-La Tuna Canyon	The proposed project consists of subdividing a single 24,818 square-foot lot into three lots for the development of two new single-family residences. Comment Period: 10/9/2014 - 10/29/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141009-07** Enclave Multifamily Residence Project	The proposed project consists of development of a five-story apartment building with 71 multi-family residential units on a 0.72-acre parcel. Comment Period: 10/9/2014 - 11/7/2014 Public Hearing: N/A	Draft Environmental Impact Report	City of Glendale	Document under review as of 10/31/14
General Land Use (residential, etc.) **LAC141010-02** Redondo Beach's California Environmental Quality Act Procedures	The proposed project consists of amending the City's CEQA procedures contained in Title 10 Chapter 3. Comment Period: 10/10/2014 - 10/21/2014 Public Hearing: 10/21/2014	Notice of a Public Hearing	City of Redondo Beach	Document reviewed - No comments sent
General Land Use (residential, etc.) **LAC141014-02** City Ventures La Habra Civic Center Infill Housing Project	The proposed project consists of developing approximately 5.5 acres within and adjacent to the City of La Habra Civic Center. http://www.aqm.gov/docs/default-source/ceqa/comment-letters/2014/october/nopcityventlahabra.pdf Comment Period: 10/14/2014 - 11/12/2014 Public Hearing: N/A	Notice of Preparation	City of La Habra	SCAQMD staff commented 10/21/2014

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SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS
General Land Use (residential, etc.) **LAC141014-04** 5833 Crest Road Project (PA-25-14)	The proposed project consists of the construction of four two-story, detached patio homes. The proposed homes would be approximately 3,295 square feet in floor area on a 0.51-acre site. Comment Period: 10/9/2014 - 11/24/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Rolling Hills	Document reviewed - No comments sent
General Land Use (residential, etc.) **LAC141016-01** ENV-2014-1618/ 3419-3429 West 6th Street (544-550 South Kenmore Avenue); Wilshire	The proposed project consists of constructing 53 residential units within a three-story building above an existing four-story parking structure with ground floor and basement level commercial uses, for a total of seven. Comment Period: 10/16/2014 - 11/5/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141016-02** ENV-2014-2498/ 2424 South 4th Avenue; West Adams-Baldwin Hills-Leimert	The proposed project consists of a condominium conversion of an existing four-unit historic building known as the Roberta Apartments and identified as Los Angeles Cultural Monument #1065. Comment Period: 10/16/2014 - 11/5/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141016-04** ENV-2006-7211/ 805-823 S. Catalina St. and 806-820 S. Kenmore Ave.; Wilshire	The proposed project consists of the construction of a mixed-use building with 27 stories of 300.5 feet in height, 269 residential units, 7,500 square feet of ground/second floor retail space, and 562 parking spaces, including two subterranean levels. Comment Period: 10/16/2014 - 11/5/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document under review as of 10/31/14
General Land Use (residential, etc.) **LAC141016-05** ENV-2014-977/ 2056 N. Morgan Hill Dr.; Hollywood	The proposed project consists of a second story single-family addition over a basement. Comment Period: 10/16/2014 - 11/5/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document reviewed - No comments sent

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SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS
General Land Use (residential, etc.) **LAC141016-07** ENV-2014-1780/ 9309 W. Sierra Mar Dr.; Hollywood	The proposed project consists of a remodel and a 1,007 square-foot addition to an existing single-family dwelling. The project includes the demolition of an existing garage, installation of a new elevator, and the construction of a new pool. A total of approximately 780 cubic yards will be graded as a part of the project. The project may require haul route approval. Comment Period: 10/16/2014 - 11/5/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141016-09** 515 W. Broadway Mixed-Use Project	The proposed project consists of a mix of multi-family and single-family development on 1.78 acres. The Project includes the development of a five-story mixed-use building with 180 multi-family residential dwelling units and 18,200 square feet of ground-floor commercial space. Comment Period: 10/15/2014 - 11/14/2014 Public Hearing: N/A	Draft Environmental Impact Report	City of Glendale	Document under review as of 10/31/14
General Land Use (residential, etc.) **LAC141021-09** Gordon Mull Subdivision	The proposed project consists of grading and installing of infrastructure improvements to create 19 defined building pads to be developed with two-story single-family residences. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/nopgordon.pdf Comment Period: 10/20/2014 - 11/19/2014 Public Hearing: N/A	Notice of Preparation	City of Glendora	SCAQMD staff commented 10/24/2014
General Land Use (residential, etc.) **LAC141023-01** ENV-2014-3003/ 11135-11145 West Burbank Boulevard; North Hollywood-Valley Village	The proposed project consists of demolishing seven commercial and residential buildings and the construction, use and maintenance of a 38,531 square-foot, four-story, 53-foot tall, 70-room hotel. Comment Period: 10/23/2014 - 11/12/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document under review as of 10/31/14
General Land Use (residential, etc.) **LAC141023-02** ENV-2014-1057/ 22 N. Latimer Rd.; Brentwood-Pacific Palisades	The proposed project consists of a new 6,000 square-foot, two-story, single-family residence with swimming pool and spa. Comment Period: 10/23/2014 - 11/12/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141023-03** ENV-2014-1751/ 6724 N Allott Ave.; Van Nuys-North Sherman Oaks	The proposed project consists of subdividing an existing 33,159 square-foot lot into three lots, and the construction of one single-family dwelling. Comment Period: 10/23/2014 - 11/12/2014 Public Hearing: N/A	Notice of Availability of a Draft Environmental Assessment	City of Los Angeles	Document screened - No further review conducted

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SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS
General Land Use (residential, etc.) **LAC141023-04** ENV-2014-2443/ 841 E. 4th Pl; Central City North	The proposed project consists of restoring and converting an existing warehouse building into 78,600 square feet of office uses, 25,000 square feet of retail, and 20,000 square feet of restaurant uses. Comment Period: 10/23/2014 - 11/12/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document under review as of 10/31/14
General Land Use (residential, etc.) **LAC141023-06** ENV-2014-4000/ 360 S. Alameda St. and 125 Industrial St.; Central City North	The proposed project consists of two development projects. The project at 31525 Industrial Street proposes construction of a seven-story mixed use building with 360 live-work units and 11,575 square feet of commercial space. The project at 360 South Alameda proposes construction of a six-story mixed-use building with 63 live/work units and 2,500 square feet of commercial space. Comment Period: 10/23/2014 - 11/12/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document under review as of 10/31/14
General Land Use (residential, etc.) **LAC141023-07** ENV-2014-2382/ 4422 W. Adams Boulevard, Los Angeles, CA	The proposed project consists of the construction and operation of a 4,886 square-foot commercial coin-operated laundry mart with 18 on-site parking space on an approximately 12,500 square-foot site. Comment Period: 10/23/2014 - 11/12/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	Document screened - No further review conducted
General Land Use (residential, etc.) **LAC141024-01** Flair Spectrum Project	The proposed project consists of a mixed-use development consisting of 640,000 gross square feet of retail and 50,000 square feet of restaurant for an outlet mall, a 250-room hotel, and 600 residential units on the 14.6-acre project site. Comment Period: 10/24/2014 - 12/8/2014 Public Hearing: N/A	Notice of Availability of a Draft Environmental Impact Report	City of El Monte	Document under review as of 10/31/14
General Land Use (residential, etc.) **LAC141024-04** Palladium Residences	The proposed project consists of a mixed-use development on an approximately 3.6-acre parcel. The project includes two development options to provide flexibility for changing market conditions. Option 1, Residential, the Project would contain up to 731 residential units. Under Option 2, Residential/Hotel, the Project would provide up to 598 residential units and a 250-room hotel with related hotel facilities such as a banquet and meeting area. Comment Period: 10/23/2014 - 12/8/2014 Public Hearing: N/A	Draft Environmental Impact Report	City of Los Angeles	Document under review as of 10/31/14
General Land Use (residential, etc.) **ODP141008-01** CEQA Alternatives Screening Report for South Orange County Reliability Enhancement EIR	The proposed project consists of a report of the screening analysis of project alternatives to be evaluated in the Environmental Impact Report for the South Orange County Reliability Enhancement project. Comment Period: N/A Public Hearing: N/A	Other	California Public Utilities Commission	Document screened - No further review conducted

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SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS
General Land Use (residential, etc.) **ORC141001-01** Alta Vista Way Retaining Wall Project	The proposed project consists of installing a secant pile retaining wall within the street, approximately where the existing curb and gutter is situated. The existing timber retaining wall would be protected-in-place and no modifications to the retaining wall would occur. Upon completion of the proposed project, the roadway, curb, and gutter would be restored to pre-project conditions. Comment Period: 10/1/2014 - 10/30/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Laguna Beach	Document screened - No further review conducted
General Land Use (residential, etc.) **ORC141001-03** Parkside at Baker Ranch Residential	The proposed project consists of closure and reclamation of the existing surface mine, and the construction of up to 250 single and multi-family attached and detached residential units on the approximately 30-acre project site. Comment Period: 9/10/2014 - 10/9/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Lake Forest	Document reviewed - No comments sent
General Land Use (residential, etc.) **ORC141007-10** Title Settlement and Land Exchange Agreement (Department of Water and Power Specific Plan Amendment Project)	This document consists of a Notice of Intent to consider an Addendum to certified FEIR. The proposed project consists of consideration of a compromise Title Settlement and Land Exchange Agreement regarding certain interests in public trust lands within the Project area prior to implementation of a proposed residential development as part of the Department of Water and Power Specific Plan Amendment Project. Comment Period: N/A Public Hearing: 10/14/2014	Other	California State Lands Commission	Document reviewed - No comments sent
General Land Use (residential, etc.) **ORC141031-01** The Preserve at San Juan, Orange County, California	The proposed project consists of construction of 72 single-family residences on 583.3 acres in an unincorporated portion of Orange County. Comment Period: 10/31/2014 - 12/1/2014 Public Hearing: N/A	Revised Notice of Preparation	County of Orange	Document under review as of 10/31/14
General Land Use (residential, etc.) **RVC141007-09** Change of Zone 07849	The proposed project consists of a permit for change of zone for the proposed project site from Agriculture to Commercial Retail. Comment Period: 10/7/2014 - 10/23/2014 Public Hearing: N/A	Initial Project Consultation	County of Riverside	Document screened - No further review conducted
General Land Use (residential, etc.) **RVC141021-04** Planning Application PA10-0213, Simms Tract Map (No. 36218)	The proposed project consists of a Tentative Tract Map to create seven residential lots for single-family dwelling units. Comment Period: N/A Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Temecula	Document screened - No further review conducted

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SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS
General Land Use (residential, etc.) **RVC141021-07** Alta Verde Linea Homes	The proposed project consists of subdividing and developing approximately 7.21 acres of land for 14 single-family residences. Comment Period: 10/16/2014 - 11/14/2014 Public Hearing: N/A	Draft Environmental Impact Report	City of Palm Springs	Document screened - No further review conducted
General Land Use (residential, etc.) **SBC141003-03** Tentative Parcel Map 36732	The proposed project consists of a proposal for the land division of 17 lots totaling 277 acres within the existing Fairway Canyon Specific Plan Area for "finance & conveyance" purposes solely. It's based on the currently approved and implemented Oak Valley SCPGA Environmental Impact Report, Specific Plan, and Underlying Tract Map 31462. Comment Period: 9/30/2014 - 10/21/2014 Public Hearing: N/A	Community Notice	City of Beaumont	Document screened - No further review conducted
General Land Use (residential, etc.) **SBC141009-05** Tentative Parcel Map SUBTPM19528	The proposed project consists of a subdivision of a parcel of 58,745 square feet into two lots within the Very Low Residential District, Etiwanda Specific Plan. The project includes the construction of a circular driveway within one of the parcels that will be created by the subdivision. Comment Period: 10/13/2014 - 11/12/2014 Public Hearing: N/A	Draft Negative Declaration	City of Rancho Cucamonga	Document reviewed - No comments sent
General Land Use (residential, etc.) **SBC141010-04** PL14-0187 (Tentative Tract Map 18957)	The proposed project consists of subdividing 17.68 acres into 84 lots for future single-family residential development. Comment Period: N/A Public Hearing: 10/20/2014	Notice of a Public Hearing	City of Chino	No review conducted - No comments sent
General Land Use (residential, etc.) **SBC141010-05** Fairfield Ranch Commons	The proposed project consists of the development of the Fairfield Ranch Commons, which consists of 346 very high density residential apartment units on 14.73 acres and a 326,641 square-foot industrial business park on 17.37 acres. Comment Period: 10/10/2014 - 11/10/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Chino Hills	Document under review as of 10/31/14
Plans and Regulations **LAC141017-04** Lincoln Specific Plan	The proposed project consists of demolishing approximately 406,261 square feet of existing building associate with the former Nelles facility and existing onsite commercial use; construction of approximately 750 dwelling units, approximately 208,350 square feet of commercial land uses, and 4.6 acres of open space and off-site infrastructure improvements including roadway improvements to Whittier Boulevard, Sorensen Avenue, and the extension of Elmer Avenue onto the Project site. Comment Period: 10/17/2014 - 12/1/2014 Public Hearing: N/A	Draft Environmental Impact Report	City of Whittier	Document under review as of 10/31/14

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Plans and Regulations **ORC141014-06** General Plan Amendment 00616969-PGA, and Municipal Code Amendment 00617535-PZC to Update Population Generation Factors	The proposed project consists of a General Plan Amendment and City Municipal Code amendment to update population generation characteristics for consistency with 2010 Census population and housing figures. Comment Period: 10/14/2014 - 10/30/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Irvine	Document screened - No further review conducted
Plans and Regulations **RVC141017-03** Terracina Specific Plan and related General Plan Amendment No. 2012-03, Zone Change No. 2012-05, Vesting Tentative Tract Map 36557, and Vesting Tentative Tract Map 36577 for financing purposes	The proposed project consists of a residential development, with approximately 76.5 acres of residential, 22 acres of open space, 22.5 acres of roadways, 1.6 acres of park, and 28.20 acres of graded slopes and basins. Comment Period: 10/16/2014 - 11/17/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Lake Elsinore	Document screened - No further review conducted
Plans and Regulations **RVC141021-02** Belle Terre Specific Plan Project	The proposed project consists of a Specific Plan that would allow for the development of up to 1,326 residential units and open space and/or recreational features. Comment Period: N/A Public Hearing: N/A	Response to Comments	County of Riverside	Document screened - No further review conducted
Plans and Regulations **RVC141021-10** Specific Plan No. 382, GPA No. 1113, GPA No. 1013, GPA No. 1014 and CZ No. 7775	The proposed project consists of a Specific Plan that consists of a 342.3 acre residential community of up to 1,282 homes. Comment Period: N/A Public Hearing: 11/5/2014	Notice of a Public Hearing	County of Riverside	Document screened - No further review conducted

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Plans and Regulations	The proposed project consists of an update to the City of Yucaipa General Plan. The Plan involves the reorganization of the Current General Plan into the following six required and one optional element: the Land Use Element; Circulation Element; Open Space and Recreation Element; Conservation Element; Safety Element; Noise Element; and Economic Development Element. Build-out of the General Plan Update would allow for up to 77,328 people, 30,077 residential units, 28,380 households, 9,581,104 square feet of non-residential uses, and 18,488 jobs. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/nopyucaipagp.pdf Comment Period: 10/1/2014 - 10/31/2014 Public Hearing: N/A	Notice of Preparation	City of Yucaipa	SCAQMD staff commented 10/8/2014
SBC141001-02 Yucaipa General Plan Update				

TOTAL DOCUMENTS RECEIVED AND REVIEWED THIS REPORTING PERIOD: 99

- Project has potential environmental justice concerns due to the nature and/or location of the project.

Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency

ATTACHMENT B*
ONGOING ACTIVE PROJECTS FOR WHICH SCAQMD HAS OR IS CONTINUING TO CONDUCT A CEQA REVIEW

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS
Warehouse & Distribution Centers **SBC140923-04** Citrus Commerce Park	The proposed project consists of developing the Citrus Commerce Industrial Park (Near Term Development Site), a warehouse (Long Term Development Site) , and a park site on a 77.56 acre site. The proposed project may include the ultimate development of four logistics warehouse buildings for a total of 2,171,449 square feet of high cube warehouse/distribution. The Near Term Development Site applications also include a Design Review Application to construct three warehouse buildings (Building 1: 634,843 square feet, Building 2: 1,1038,499 square feet, and Building 3: 209,892 square feet), and Tentative Parcel Map to merge approximately 77.57 acres into three parcels. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/deircitrus.pdf Comment Period: 9/19/2014 - 11/3/2014 Public Hearing: 10/7/2014	Notice of Availability of a Draft Environmental Impact Report	City of Fontana	SCAQMD staff commented 10/31/2014
Warehouse & Distribution Centers **SBC140926-01** Auto Plaza at Fairway Warehouse	The proposed project consists of an approximately 178,980 square-foot industrial warehouse and parking, a Major Variance to allow the reduction of required parking spaces from 203 to 112 spaces on an 8.34-acre site. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dmndautoplaza-.pdf Comment Period: 9/25/2014 - 10/14/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Colton	SCAQMD staff commented 10/1/2014
Industrial and Commercial **LAC140916-04** International Auto Crafters	The proposed project consists of constructing a new commercial building on 1.37 acres on the northeast corner of Haun Road and New Hub Drive. The 17,007 square-foot automotive body shop will be located on the western portion of the project site with the entrance facing Haun Road. The building consists of various sections of an automotive body shop and two floors of office spaces, 1,300 square feet proposed on the first floor and 950 square feet proposed on the second floor. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/mndautocrafterFB22E35E5E25.pdf Comment Period: 9/16/2014 - 10/8/2014 Public Hearing: 10/8/2014	Notice of Availability of a Draft Mitigated Negative Declaration	City of Menifee	SCAQMD staff commented 10/1/2014
Waste and Water-related **LAC140917-01** Draft Cleanup Work Plan for Public Review and Comments - Exide Technologies	The proposed project consists of a draft Interim Measures Work Plan for the removal of lead contaminated soils in residential yards located in portions of Boyle Heights, East Los Angeles and Maywood. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dtscexide.pdf Comment Period: 9/16/2014 - 10/20/2014 Public Hearing: N/A	Community Notice	Department of Toxic Substances Control	SCAQMD staff commented 10/17/2014

Sorted by Comment Status, followed by Land Use, then County, then date received.

- Project has potential environmental justice concerns due to the nature and/or location of the project.

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ATTACHMENT B
ONGOING ACTIVE PROJECTS FOR WHICH SCAQMD HAS OR IS CONTINUING TO CONDUCT A CEQA REVIEW

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS
General Land Use (residential, etc.) **LAC140925-01** ENV-2013-1931/ 728, 732, 738, 744 and 748 N. Ganymede Dr.; Northeast Los Angeles	The proposed project consists of constructing five, single-family dwellings with an attached two-car garage on five lots. The project will require a Haul Route Permit from the Department of Building and Safety for the export of 3,145 cubic yards of dirt. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dmnd732-748nganymeade.pdf Comment Period: 9/25/2014 - 10/27/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 10/9/2014
General Land Use (residential, etc.) **LAC140925-12** ENV-2014-1119/ 7128 N. Amigo Avenue; Reseda-West Van Nuys	The proposed project consists of a request for the development of a new 71-unit residential apartment building on an approximately 24,546 square-foot lot. The project will require the demolition of three single-family houses and two detached garage structures and the removal of trees. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dmnd7128namigo.pdf Comment Period: 9/25/2014 - 10/15/2014 Public Hearing: N/A	Notice of Availability of a Draft Mitigated Negative Declaration	City of Los Angeles	SCAQMD staff commented 10/9/2014
General Land Use (residential, etc.) **LAC140930-06** Arcadia 17 Residential Condominium Project at 132, 136, and 142 Las Tunas Drive	The proposed project consists of the demolition of an existing auto repair shop, restaurant, and tattoo parlor to accommodate a residential-condominium development comprised of 17, three-story, townhouse-style units. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/dmndarcadia17resid.pdf Comment Period: 9/25/2014 - 10/14/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Arcadia	SCAQMD staff commented 10/9/2014
General Land Use (residential, etc.) **RVC140923-03** General Plan Amendment GPA-013-159, Zone Change ZC-013-160, and Tentative Tract Map TTM-014-300 (TTM 36659)	The proposed project consists of implementing a residential and open space development on an approximate 8.87-acre site. The project would consist of a General Plan Amendment to develop a 52 single-family residential lot. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/mndttm36659.pdf Comment Period: 9/17/2014 - 10/7/2014 Public Hearing: N/A	Draft Mitigated Negative Declaration	City of Murrieta	SCAQMD staff commented 10/7/2014
General Land Use (residential, etc.) **RVC140925-15** Alta Verde Linea Homes	The proposed project consists of subdividing and developing 14 single-family residences on a 7.21 acre site. The 14 residential lots will range in size from 15,834 to 24,005 square feet. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/nopaltadoc.pdf Comment Period: 9/25/2014 - 10/25/2014 Public Hearing: N/A	Notice of Preparation	City of Palm Springs	SCAQMD staff commented 10/1/2014

- Project has potential environmental justice concerns due to the nature and/or location of the project.

Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency

ATTACHMENT B
ONGOING ACTIVE PROJECTS FOR WHICH SCAQMD HAS OR IS CONTINUING TO CONDUCT A CEQA REVIEW

SCAQMD LOG-IN NUMBER PROJECT TITLE	PROJECT DESCRIPTION	TYPE OF DOC.	LEAD AGENCY	COMMENT STATUS
Plans and Regulations **LAC140911-01** Montebello Hills Specific Plan	The proposed project consists of developing 1,200 residential dwelling units on approximately 173.6 acres of the project site; 314.6 acres dedicated for Open Space with a series of pedestrian walkways and trails; a 5.5-acre public park and a 1.5-acre private community center constructed for on-site residents. http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2014/october/deirmontebello.pdf Comment Period: 9/12/2014 - 10/27/2014 Public Hearing: 11/5/2014	Notice of Availability of a Draft Mitigated Negative Declaration	City of Montebello	SCAQMD staff commented 10/24/2014

TOTAL NUMBER OF REQUESTS TO SCAQMD FOR DOCUMENT REVIEW THIS REPORTING PERIOD: 99
TOTAL NUMBER OF COMMENT LETTERS SENT OUT THIS REPORTING PERIOD: 31
TOTAL NUMBER OF DOCUMENTS REVIEWED, BUT NO COMMENTS WERE SENT: 11
TOTAL NUMBER OF DOCUMENTS CURRENTLY UNDER REVIEW: 23
TOTAL NUMBER OF DOCUMENTS THAT DID NOT REQUIRE COMMENTS: 3
TOTAL NUMBER OF DOCUMENTS THAT WERE NOT REVIEWED: 1
TOTAL NUMBER OF DOCUMENTS THAT WERE SCREENED WITHOUT ADDITIONAL REVIEW: 40

- Project has potential environmental justice concerns due to the nature and/or location of the project.
Comment letters can be accessed at: http://www.aqmd.gov/home/regulations/ceqa/commenting-agency

ATTACHMENT C
ACTIVE SCAQMD LEAD AGENCY PROJECTS
THROUGH OCTOBER 31, 2014

PROJECT DESCRIPTION	PROPONENT	TYPE OF DOCUMENT	STATUS	CONSULTANT
Operators of the Ultramar Wilmington Refinery are proposing to construct and install a 49 MW cogeneration unit to reduce the refinery's reliance on electricity from the Los Angeles Department of Water and Power and produce steam to meet internal needs. No other refinery modifications are proposed.	Ultramar Wilmington Refinery	Negative Declaration	Staff revised responses to the 3 comment letters received on Draft ND and consultant is providing edited responses and finalizing the Draft ND. Responses to CEQA comments made on permit notice comment letter have been prepared and included in the Final ND that was certified on October 10, 2014.	Environmental Audit, Inc.
The Phillips 66 (formerly ConocoPhillips) Los Angeles Refinery Ultra Low Sulfur Diesel project was originally proposed to comply with federal state and SCAQMD requirements to limit the sulfur content of diesel fuels. Litigation against the CEQA document was filed. Ultimately, the California Supreme Court concluded that the SCAQMD had used an inappropriate baseline and directed the SCAQMD to prepare an EIR, even though the project has been built and has been in operation since 2006. The purpose of this CEQA document is to comply with the Supreme Court's direction to prepare an EIR.	Phillips 66 (formerly ConocoPhillips), Los Angeles Refinery	Environmental Impact Report	The Notice of Preparation was circulated for a 30-day public comment period on March 26, 2012. The comment period ended on April 26, 2012. The consultant submitted the administrative Draft EIR to SCAQMD in late July 2013. SCAQMD reviewed the Draft EIR and released for a 45-day public review and comment period on September 30, 2014.	Environmental Audit, Inc.
The Phillips 66 Los Angeles Refinery operators are proposing to install one new 615,000-barrel crude oil storage tank with a geodesic dome to accommodate larger marine vessels delivering crude oil. The proposed project also includes increasing the throughput (i.e., frequency of filling and emptying tank) on two existing tanks and adding geodesic domes to these tanks, installing one new 14,000-barrel water draw surge tank and installing one new electrical power substation.	Phillips 66 Los Angeles Refinery Carson Plant	Negative Declaration	The Draft ND was released for a 30-day public review and comment period beginning on September 10, 2013 and ending on October 9, 2013. Three comment letters were received. SCAQMD reviewed the responses to the comment letters and the consultant is making edits to the responses and finalizing the Draft ND.	Environmental Audit, Inc.
Tesoro Refinery proposes to integrate the Tesoro Wilmington Operations with the Tesoro Carson Operations (former BP Refinery). The proposed project also includes modifications of storage tanks at both facilities, new interconnecting pipelines, and new electrical connections. In addition, Carson's Liquid Gas Rail Unloading facilities will be modified. The proposed project will be designed to comply with the federally mandated Tier 3 gasoline specifications and with State and local regulations mandating emission reductions.	Tesoro Refining and Marketing Company Los Angeles Refinery	EIR	A previous Draft ND was withdrawn in order for this project to be analyzed in a new CEQA document that also addresses the upcoming Tesoro-BP Refinery Integration Project. An NOP-IS has been prepared for the integration project and released for a 30-day public review and comment period on September 10, 2014 closing on October 10, 2014. 86 comment letters were received.	Environmental Audit, Inc.

ATTACHMENT C
ACTIVE SCAQMD LEAD AGENCY PROJECTS
THROUGH OCTOBER 31, 2014

PROJECT DESCRIPTION	PROPONENT	TYPE OF DOCUMENT	STATUS	CONSULTANT
Operators of the KinderMorgan Lomita Terminal are proposing to deliver crude oil by expanding their rail facility.	KinderMorgan Lomita Terminal	To Be Determined	The consultants are preparing emission estimates to determine the type of CEQA document to be prepared.	SABS Consulting and TRC
Operators of the Petro Diamond Marine Terminal are proposing to increase the number of ship calls delivering ethanol.	Petro Diamond	To Be Determined	The consultant has prepared a Draft Negative Declaration. SCAQMD staff is currently reviewing the Draft Negative Declaration to determine if it is the appropriate type of CEQA document for the project.	SABS Consulting
Quemetco is proposing an increase in daily furnace feed rate.	Quemetco	To Be Determined	Initial Study under review by SCAQMD staff.	Trinity Consultants
Chevron is proposing modifications to its Product Reliability and Optimization (PRO) Project and has applied for a change of permit conditions to reduce NOx emissions and fired duty operating conditions of the Tail Gas Unit.	Chevron	Addendum	Under staff review and edits provided to the consultant. Chevron currently conducting BACT review for equipment.	Environmental Audit, Inc.
Signal Hill Petroleum is proposing to upgrade the existing natural gas processing plant and enhance their vapor recovery system. No new combustion equipment will be installed.	Signal Hill Petroleum Gas Plant	Subsequent Mitigated Negative Declaration	The consultant has prepared an SMND and SCAQMD Staff is currently reviewing.	RBF Consulting
Exide Technologies is proposing a project to reduce toxic emissions of arsenic, benzene and 1,3-butadiene to comply with SCAQMD Rules and Regulations.	Exide Technologies	Mitigated Negative Declaration	SCAQMD Staff has prepared a Draft MND that was released for a 30-day public review and comment period on October 16, 2014.	Environ
Breitburn Operating LP is proposing to upgrade their fluid handling systems to facilitate an increase in the amount of produced water that can be treated at the site in Sante Fe Springs.	Breitburn Operating LP	Environmental Impact Report	Staff is reviewing an NOP/IS prepared by the consultant.	Environ

COMMUNITIES FOR A BETTER ENVIRONMENT

January 2, 2015

Via Electronic Mail

South Coast Air Quality Management District
21865 Coley Drive,
Diamond Bar, CA 91765

Re: Community Demand to Immediately Withdraw December 12, 2014 Notice of Determination for the Final Negative Declaration for Phillips 66 Los Angeles Refinery Carson Plant Crude Oil Storage Capacity Project – SCH. No. 2013091029.

Dear Ms. Radlein, Mr. Krause and Ms. Tyagi,

I am writing to you today on behalf of Communities for a Better Environment ("CBE") and its members who reside in Wilmington, to call your attention to an issue that deserves your careful consideration, and immediate action. As you are aware, based on your review of formal comments submitted to the South Coast Air Quality Management District ("District") as well as other forms of communication including correspondence via email, and in-person and phone conversations with District staff including each of your individual offices, CBE is concerned about the District's minimal and often cursory review of new, proposed refinery modification, crude transport and storage projects that affect CBE's members and other, similarly situated residents of environmental justice communities.

The District's December 12, 2014 decision to finalize the Phillips 66 Carson Project Negative Declaration demonstrates a complete disregard for the District's duty to protect particularly vulnerable South Coast Air Basin residents from the impacts of transporting, receiving, storing and processing dangerous crudes from known domestic and Canadian sources. By finalizing its minimal environmental review document, the District has failed to conduct the level of environmental review required to assess and mitigate the Phillips 66 Carson Project's impacts, and has additionally failed to take reasonable and necessary steps to protect the public by providing adequate notice of its decision. Indeed by issuing its notice of determination on December 12, a mere week before the 2014 Christmas holiday, and by neglecting to ensure actual prompt notice to commenters and known interested advocates, the District appears to be

intentionally undercutting the public's legal right to challenge its decision making regarding this project. As such, and for the additional reasons briefly described herein, we demand that you immediately withdraw the District's December 12, 2014 final determination approving the Phillips 66 Carson Project Negative Declaration.

1. ***The District's decision to finalize the Phillips 66 Carson Project Negative Declaration ignores cumulative impacts from other projects and environmental justice concerns.***

Currently there are 3 refinery projects being proposed in Wilmington and the adjacent City of Carson, as well as additional project-related permit applications at various stages of review by the District. All 3 projects directly impact many of CBE's members and other residents living *directly on the fenceline* of the refineries at which they are being proposed.

These 3 projects include:

1) The Phillips 66 Carson Plant Crude Oil Storage Capacity Project ("Phillips 66 Carson Project") for which the District issued a Notice of Intent to Adopt a Negative Declaration, pursuant to the California Environmental Quality Act ("CEQA") on September 10, 2013 and recently issued its Notice of Determination for a Final, unchanged Negative Declaration, dated December 12, 2014;
2) The Phillips 66 Wilmington Ultra Low Sulfur Diesel Project, for which the District issued a Draft Environmental Impact Report on September 26, 2014; and,
3) The Tesoro-BP Refinery Integration Project, for which the District issued a notice of preparation of a Draft Environmental Impact Report on September 9, 2014 (and for which the District is also reviewing two Title V permit revisions and renewals--for the Tesoro Marine Terminal 2 and the Tesoro Hynes Terminal in Long Beach).

Wilmington and the cities of Carson and Long Beach rank among the State's top most pollution-burdened and vulnerable areas.[1] Residents of these communities live with the day-to-day impacts of various forms of heavy industry, oil extraction and refining operations, port and other goods-movement and transport activities, including significant levels of air pollution caused by diesel truck and railroad transport.[2] As such, these residents rely heavily on the oversight of agencies like the District to ensure that permitting decisions regarding additional, highly polluting industrial projects are made wisely, with careful attention to the true range of environmental and health impacts resulting from each individual project alone, and in the context of existing

[1] Wilmington, Carson and parts of Long Beach rank in the top 20% (with several areas in the top 5%) most overburdened and vulnerable areas in the State according to the most recent version of the California Environmental Protection Agency's CalEnviroScreen, version 2.0. (*See* http://oehha.maps.arcgis.com/apps/OnePane/basicviewer/index.html?&extent={"xmin":-13166567.802417224,"ymin":4001409.3038827637,"xmax":13157213.82108084,"ymax":4005584.676552836,"spatialReference":{"wkid":102100}}&appid=a4a95185c71f4817bf03aeae25923695 (last accessed, Dec. 23, 2014).
[2] *See Id.*

cumulatively considerable burdens.[3]

Despite the existing burden on this area, the District is conducting an impermissibly superficial level of environmental review for projects directly impacting some of the region's most vulnerable neighborhoods. While this problem is in large part a result of inaccurate and often misleading project descriptions contained in the applications submitted by refinery operators, the District is responsible for ensuring that CEQA and other air quality and human health protective requirements are met before it moves forward in issuing or approving any permits or other project-related approvals, including approvals of environmental review documents and permit renewals or revisions.[4]

The District's December 12, 2014 Notice of Determination regarding the Phillips 66 Carson Project Negative Declaration demonstrates the District's refusal to conduct the level of environmental review required to assess and mitigate the full range of the project's impacts, including its cumulatively considerable impacts, and its failure to take reasonable and necessary steps to protect the public by providing adequate notice of its decisions.

2. The District intentionally refused to ensure that advocates and known interested parties were given adequate notice of its December 12, 2014 decision.

After over a year of silence regarding the status of the Phillips 66 Carson Project's Draft Negative Declaration, the District decided to finalize its unchanged draft document a week before the Christmas holiday. Despite the fact that CBE submitted extensive comments on the draft Negative Declaration on October 9, 2013, and despite CBE's persistent requests for information concerning this, and other similar projects, the District further failed to ensure that CBE

[3] *See, Laurel Heights Improvement Assn. v. Regents of Univ. of California* (1988) 47 Cal.3d 376, at 394 (holding that the significant cumulative effects of a project must be considered in an EIR, and specifying that such required cumulative effects should encompass "past, present, and reasonably anticipated future projects."); *see also*, CEQA Guidelines, § 15064 (h)(1) (also requiring preparation of an EIR, where cumulative impacts are considerable, and providing that "[w]hen assessing whether a cumulative effect requires an EIR, the lead agency shall consider whether the cumulative impact is significant and … An EIR must be prepared if [a] Project's incremental effect, though individually limited, is cumulatively considerable[,]" meaning that "incremental effects of an individual project are significant when viewed in connection with the effects of past projects … other current projects, and … probable future projects"), and §15355 ("'Cumulative impacts' refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts"); *see also*, Clean Air Act, Declaration of Purpose, at 42 U.S.C. § 7401(b)(1)-(3), (c)(providing that the purpose of the Act is to enhance the quality of the Nation's air resources so as to promote the public health and welfare; and to encourage and assist the development and operation of regional air pollution prevention and control programs to do the same.).

[4] *See* Cal. Pub. Res Code § 21082.2(a) (requiring the lead agency to determine whether a project may have a significant effect on the environment based on substantial evidence in light of the whole record.); *see also Citizens Assoc. For Sensible Development of Bishop Area v. County of Inyo* (1985) 172 Cal.App.3d 151("The lead agency must consider the whole of an action, not simply its constituent parts, when determining whether it will have a significant environmental effect."); and *see* CEQA Guidelines § 5041(setting forth the Lead Agency's Authority to mitigate negative environmental impacts, and providing that "A lead agency for a project has authority to require feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant effects on the Environment.").

advocates, staff and members were given actual, prompt notice of its final determination.[5] Rather than emailing notice of its decision to commenters, as has been its common practice, the District merely posted its decision on its website and sent the same notice in the mail which arrived over a week after the District's determination had been made.[6]

3. The District's decision to finalize the Phillips 66 Carson Project Negative Declaration amounts to a quiet, rubber stamp approval for the increased transport, storage and processing of dangerous domestic and Canadian derived crudes.

The District's responses to comments concerning the Phillips 66 Carson Project further expose the agency's cavalier approach to the serious human health and environmental concerns raised by commenters to that project, as well as other, similar projects. In its responses, the District admits that Phillips 66 not only plans to bring down heavy tar sands and dangerous bakken crudes in the foreseeable future, but it also concedes that the refinery has been processing the same crude types, without disclosure to the public for some, unknown period of time.[7] Publicly exposing this fact in the same act in which it rubber stamps its minimal review of the Project's potential impacts presents a clear dereliction of the agency's duty to protect the environment and to minimize air emissions in the South Coast.[8]

4. Because the District has refused to conduct the level of environmental review required under state law, and has deliberately refused to provide actual notice of its decision, its December 12, 2014 final determination must be withdrawn.

In sum, while the District has provided responses to comments regarding CBE's concerns with Phillips 66's explicit plans to refine dangerous new crudes, it has failed to address the resultant impacts that such refining will have on some of the South Coast's most vulnerable residents. The District's decision to refuse to ensure that such residents and their advocates were notified before the peak of the winter holiday season, further demonstrates its disregard for those bearing the brunt of the impacts from such a project, and its desire to fast-track its permit

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[5] In addition to requesting information and updates in the enclosed letters, CBE staff attorneys have called District staff offices to leave messages, or have had phone conversations with individual District staff members including Barbara Radlein, Veera Tyagi, Mike Krause and other staff on at least the following dates: February 14, March 20, July 18, August 8, August 20, September 11, October 7 2014, and November 5, 2014.

[6] The District sent notice to CBE by mail, postmarked four days after the determination--on December 16, 2014--which arrived at CBE's offices three days later (Friday afternoon, December 19), and was received by one of the intended recipients on December 22, ten days after the District certified the Final Negative Declaration.

[7] *See e.g*., Notice of Determination – Final Negative Declaration Phillips 66, Los Angeles Refinery – Carson Plant Crude Oil Storage Capacity Project – SCH No. 2013091029, at Appendix F, Response 2-9, F-42.

[8] *See City of Redlands v. County of San Bernardino* (2002) 96 Cal.App.4th 398, 405 (holding that an (EIR) must be prepared under CEQA whenever substantial evidence in the record supports a "fair argument that a proposed project will have a significant effect on the environment" (citations omitted).); *see also*, CEQA Guidelines §15384, and 42 U.S.C. § 7401(b)(1)-(3), (c), *supra*; *and see* Cal. Health and Safety Code § 40001(b) (District rules and regulations may, and at the request of the state board provide for the prevention and abatement of air pollution episodes which, at intervals, cause discomfort or health risks to, or damage to the property of, a significant number of persons or class of persons.).

approvals in a manner that contravenes public input, and undercuts the public's legal rights to challenge the District's decision making.

For these reasons, and for the additional reasons expressed in CBE's comments on the above listed projects, as well as the additional, attached correspondence, we urgently request that you take immediate steps to withdraw the December 12, 2014 Notice of Determination for the Final Negative Declaration for the Phillips 66 Carson Project.

Sincerely,

/s
Yana Garcia
Staff Attorney
Communities for a Better Environment
(510) 302-0430 ext. 22
ygarcia@cbecal.org

Maya Golden-Krasner
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/s
Adrian Martinez
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(415) 217-2000
amartinez@earthjustice.org

The Proposed Negative Declaration by SCAQMD for the Tesoro Pipeline from its Long Beach Marine Terminal to New Wilmington Refinery Storage Tanks is Missing Major Expansion Plan Descriptions and Requires a Full EIR

Comments of Julia E. May,
Senior Scientist, CBE
June 10, 2014

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A. Project description

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1. Industry literature identified these plans
2. Tesoro also published these plans

III. Potential impacts of the Project

A. Changes in crude oil feedstock associated with the Project have significant impacts

1. Waxy Bakken crude oil requires special handling and creates problems of transfer in both marine vessels and refinery storage tanks and requires chemical dispersants
2. Bakken crude also causes fouling of preheaters, heat exchangers, and furnaces, refinery corrosion, and can shutdown refinery units
3. Bakken crude is volatile and explosive , and these characteristics were not evaluated in the ND
4. Bakken crude can also increase levels of acutely hazardous and corrosive Hydrogen Sulfide in the refinery
5. Another "advantaged" crude oil from Canadian Tar Sands that Tesoro plans to import also causes major impacts
6. The Project Description failed to provide baseline data on the current crude oil slate, to compare it to the "advantaged" crudes the Project allows, and to identify the potentially significant impacts of such changes

B. Integrating the Wilmington and Carson refinery units and logistics operations is related to the Project, and has the potential to cause major impacts

C. Marine Loading operation changes have potential significant impacts

D. The increased Storage Tanks themselves have significant impacts

E. The Project has the potential to increase coking

F. The approximate mile-long expanded pipeline from the Marine Terminal to the Wilmington refinery tanks increases earthquake risk of spills

G. Other Potential Project Impacts

IV. Conclusion – Potential Impacts are large, have not been mitigated, no alternatives or Cumulative Impacts were analyzed, and an EIR must be developed

I. Introduction

This report evaluates the Tesoro Storage Tank Replacement and Modification Project (described hereafter as the "Project") in Wilmington and finds that a Negative Declaration (ND) published by the South Coast Air Quality Management District should not be adopted, because the Project has broad implications for changing operations at the refinery, marine operations, in integration of the Wilmington with the Carson refinery, among other changes. These changes have significant impacts that need to be evaluated through a full Environmental Impact Report (EIR).

II. The Project Description is flawed – the Pipeline & Storage Tank Negative Declaration is contradicted by Tesoro's Published Broader Plans

A. Project description

The ND[1] describes the Project as merely a way to offload products faster, to speed getting ships out of harbor, unrelated to other transportation and refinery operations. For example, it states:

> *Description of Nature, Purpose, and Beneficiaries of Project: The Tesoro Refining & Marketing Company LLC (Tesoro) is proposing a storage tank replacement and modification project at its Los Angeles Refinery – Wilmington Operations* ***to increase the amount of crude oil that can be stored, and to increase the efficiency of the crude oil deliveries from ships****. . . .*

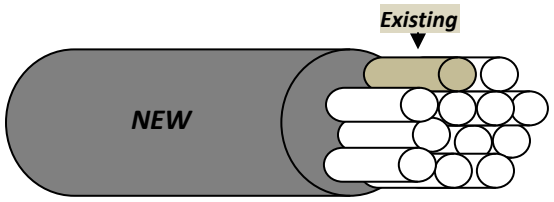
The ND describes very large storage expansion (440,000 bbls per day increase for two tanks, plus increased throughput of 150,000 bbls/month for one tank), and changes in materials stored:

	Current size	Proposed size	Permitted Materials Stored	Proposed Materials Stored
Tank 80035 - Fixed to Internal floating roof	80,000 bbl	300,000 bbl	Petroleum materials including crude oil, hydrocracking unit (HCU) feedstock (a light gas oil); currently primarily stores HCU feedstock (ND p. 1-1)	Light & heavy crude oils of varying vapor pressures up to 11psi, light gas oils (such as HCU feedstock &FCCU Feedstock), & heavy gas oils, but ND also states these will primarily store crude oil
Tank 80036 - Fixed to Internal floating roof	80,000 bbl	300,000 bbl		
Tank 80038 Fixed roof w/out vapor recovery, connect to vapor recovery	80,000 bbl	No size change	Petroleum distillate w/true vapor pressure <0.5psi such as crude oil & heavy gas oils, currently primarily stores vacuum gas oil (heavy)	Change types of materials stored to also include light gas oil
Tank 80079 Internal floating roof tank	80,000 bbl	Same size, but increased throughput from 350,000 to 500,000 bbls/month	Petroleum distillate w/true vapor pressure <7.6psi such as crude oil, heavy gas oils, light gas oils, diesel fuel, primarily stores crude oil	No change in types of materials permitted to be stored

[1] Negative Declaration at p. 2-1, and Notice of Intent to Adopt a Draft Negative Declaration, Tesoro Storage Tank Replacement and Modification Project, at 2nd page.

No specific baseline data is provided on the current materials actually stored in the tanks.

The description also proposes greatly increased pipe sizing (from a 12-inch diameter pipe, to a 42-inch pipe) for delivery of crude oil and other materials from the Marine Terminal to these storage tanks. The volume of material that can be delivered through a pipe is dependent on cross-sectional area; the 42-inch pipe would allow a delivery increase of over 12 times the volume currently able to be delivered.[2]



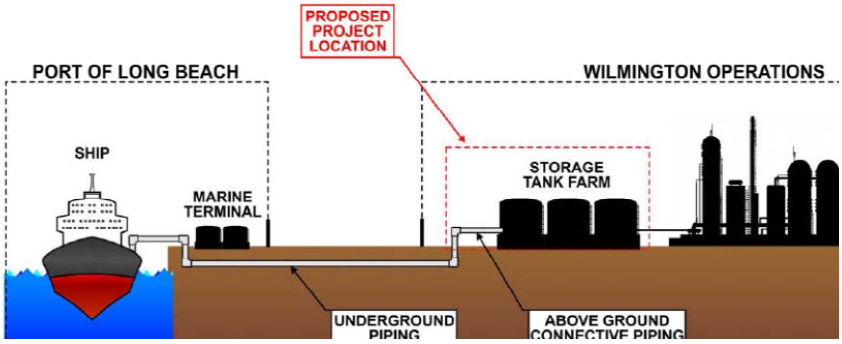
← *Over 12 twelve-inch pipes would fit into one 42-inch pipe, so the volume of crude oil & other petroleum liquids that can be offloaded through the new pipe is over 12 times higher than the existing pipe*

The description incorrectly concludes there will be no significant impacts, and counter to Tesoro's public statements documented later, there will be no changes in materials delivered:

> *No changes to the type of materials delivered to the Wilmington Operations are proposed. The following environmental topic areas were identified as having the potential to be affected by the proposed project: air quality and greenhouse gas emissions; energy; geology and soils; hazards and hazardous materials; hydrology and water quality; noise; solid and hazardous waste; and transportation and traffic. However, the analysis of these environmental topic areas in the Draft Negative Declaration (ND) concludes that the proposed project would not generate any significant adverse environmental impacts.*

But the changes described above have the potential for major operational debottlenecking and changes in materials (e.g. crude oil) delivered, with associated impacts described below. Furthermore, Tesoro has publicly announced such changes outside of the ND process.

The following graphic of the project was provided in the ND (at p. 1-10):

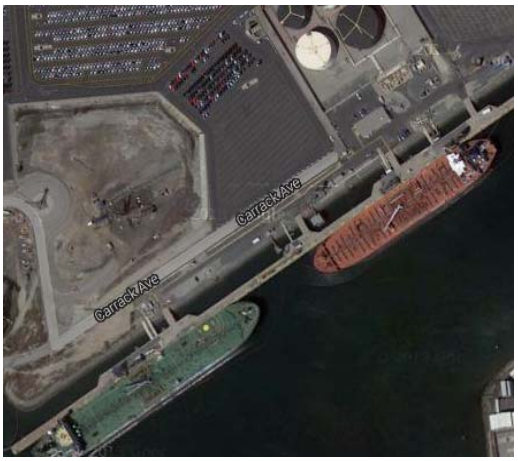


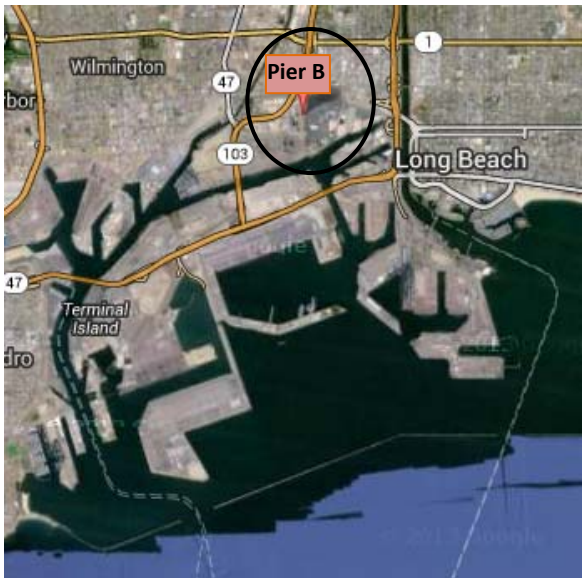
[2] A 12 inch diameter = 6 inch radius, a 42 inch diameter = 21 inch radius. Volume of material delivered depends on the pipe cross-section area. The cross-sections of the two pipes' areas are: For 12 inch pipe the area = $\Pi r^2 = 3.14 \times (6*6)$ sq inches, or 3.14 x 36; For 42 inch pipe the area = 3.14 x (21*21) or 3.14 x 441. Thus the 42 inch pipe cross-section area is larger than the 12 inch pipe by a factor of 441/36, or 12.25.

The difference in the physical locations of the Marine Loading terminal and the refinery shown in the graphic above and the satellite images below illustrates that there will be a large increase in petroleum materials piped in the range of a mile from the terminal to the refinery. This in itself increases the risk of spills, especially during earthquakes. The ND states that there will not be a physical change at the Marine Terminal itself, but it fails to evaluate the major increase in volume of materials that will be present in the pipes at any one moment.

The Pier B Tesoro facility (Port of Long Beach, 820 Carrack Ave, Long Beach 90813, Facility ID 172878, Tesoro Logistics Operations LLC) was identified by the SCAQMD by telephone as the marine loading facility involved in the Project, although Tesoro Logistics now owns three marine loading facilities in Los Angeles. Different magnifications are inserted below, including Pier B, and the Wilmington refinery (on the order of a mile away):

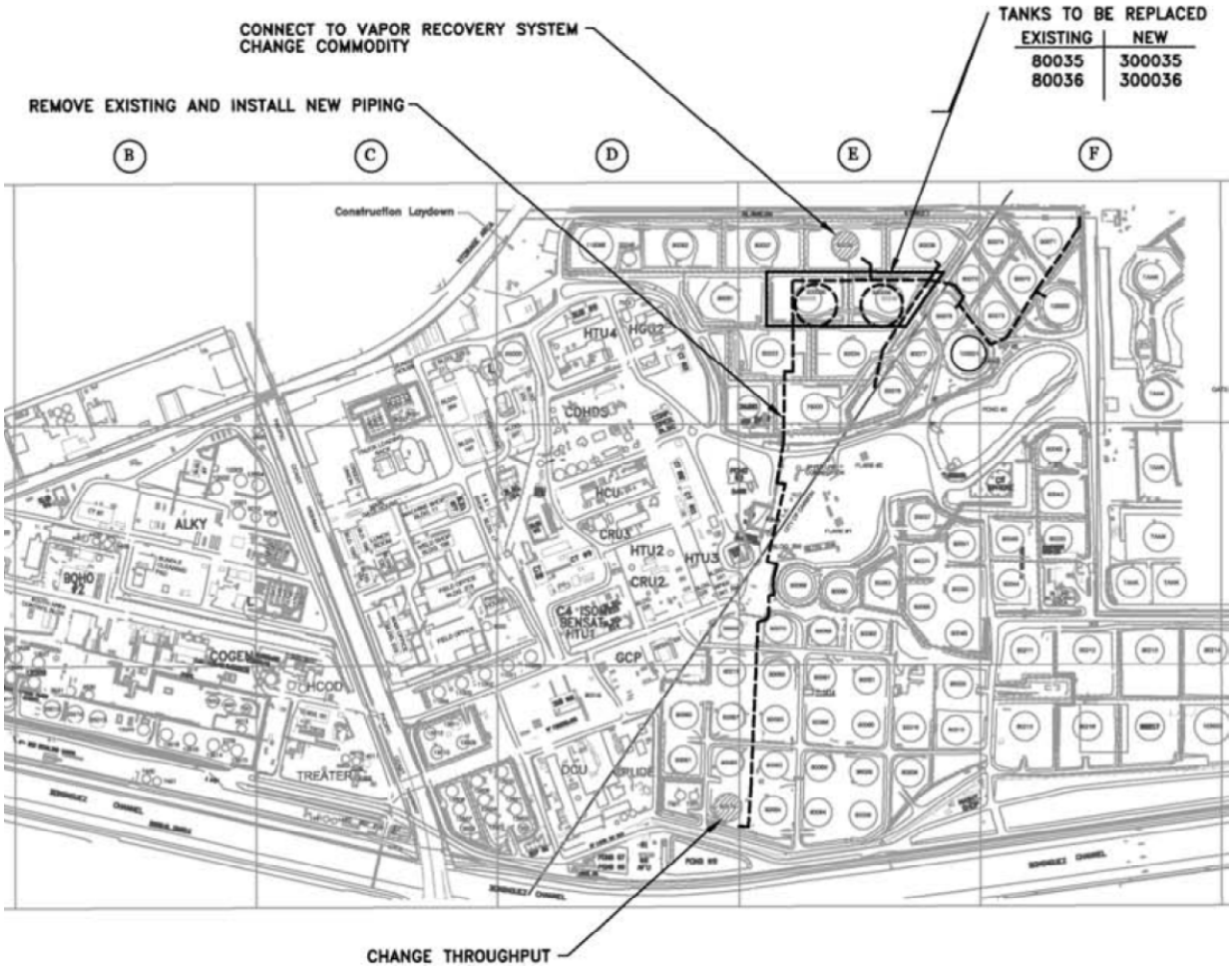








The map below, excerpted from the ND (at p. 1-6), depicts the long path of the new pipeline across the refinery to the new refinery tanks. (This map has been rotated 90 degrees to make wording readable.) It also shows that the pipe goes *beyond* the new tanks, to the corner of the Wilmington property.



B. Tesoro has published plans to increase throughput, yields, transport alternative crude types by rail to Washington then by ship to Long Beach, and to integrate the Wilmington refinery with the adjacent Carson refinery

Both industry literature and Tesoro statements reveal that Tesoro has been planning the following:

- Increased throughput at its California refineries (including its Wilmington and Carson complex),
- Increased product yield,
- Integration of the Wilmington and Carson refineries,
- Changes in crude oil type delivery and processed in favor of cheaper crudes ("advantaged" or "discount" crudes which can have negative impacts when transported and refined),

- Use of rail to transport crude to Tesoro's Vancouver Washington shipyard, and then by ship to California refineries (from Bakken oil fields in North Dakota but also potentially from Canadian tar sands fields),
- Use of its facilities by Third parties and for export, and
- Increased coking operations.

The alternative crude would be offloaded from marine vessels, sent through the greatly expanded pipeline described in the ND, and stored in the massively expanded storage tanks proposed. Importantly, the Wilmington and Carson refinery operations share a fenceline.

These publicly acknowledged projects are clearly related to the storage tank expansion, and demonstrate that the proposed Project goes far beyond simple ship offloading efficiency. Even if we had no knowledge of these plans, such storage expansion would have the *potential* to allow expanded activities at the refinery and the Marine Loading dock, and to change operations through integration with Tesoro's Carson refinery. These operations cannot be "piecemealed" from the storage project, and must be evaluated together through a full EIR.

1. Industry literature identified these plans

An example of an industry literature report on Tesoro plans is provided by Morningstar Inc. (a multinational, multi-billion dollar research and investment management firm[3]), which published the following analysis in July of 2013: [4]

> *Tesoro aims to **increase throughput** of domestic crude over the next few years*
>
> *Tesoro has embarked on a multiyear plan to improve its profitability, including increasing spending to support larger income improvement projects. The most significant of those, including capacity expansions and rail facilities, aim to take advantage of domestic crude discounts. . . .*
>
> ***We think, however, the biggest area of opportunity for Tesoro to improve its profitability is by increasing processing of discount crude, particularly in its primary market of California,** where operating conditions remain challenging. The company is highly leveraged to developments within the state and that will only increase with its proposed acquisition of BP's BP **Carson** refinery. Operating in California can be advantageous because West Coast margins typically fetch a premium given the state's relative isolation from outside sources of refined product and specialized gasoline blends. . . .*
>
> ***The increased availability of discount crude bolsters the potential for the Carson acquisition despite the increased exposure to California.** Specifically, Tesoro can **dramatically improve the performance of Carson by optimizing its crude slate with light crude from the Bakken.** Also, on its face the deal looks like a winner for Tesoro given the relatively attractive valuation of the refinery and the collection of associated*

[3] http://corporate.morningstar.com/US/asp/subject.aspx?xmlfile=177.xml

[4] 7/24/2013 http://analysisreport.morningstar.com/stock/archive?t=TSO&region=USA&culture=en-US&productcode=MLE&docId=604033 (emphasis added throughout quotes)

> *midstream assets that can be dropped down to Tesoro Logistics TLLP.* ***Tesoro should gain further advantages from integrating Carson with the Wilmington refinery.*** *. . .*
>
> ***The addition of Carson and its integration with Tesoro's Wilmington refinery*** *should lower costs and better position the company to deal with increasing environmental regulation. . . .* [Emphasis added throughout and below]

Discount crudes generally have negative impacts as described below. For example, Canadian tar sands crude oil is very heavy, with high sulfur, requiring more intensive refining, and Bakken crude oil from the Dakotas has high paraffinic content (wax) and is explosive. These require specialized handling or more intensive refining with environmental and safety impacts (described later). The article also identifies the potential for Tesoro to import either Bakken or Canadian heavy tar sands crude.

> ***Increasing throughput of light and heavy discount crude from the Mid-Continent and Canada via rail will likely benefit Tesoro more, though.*** *To this end, Tesoro recently entered an agreement to develop a 120 mb/d crude by rail and marine facility in Washington.* ***The facility should be operational in 2014 and affords Tesoro the flexibility to send light or heavy crude to its California refineries.*** *Tesoro's California refineries should realize higher margins and improved returns through lower feedstock costs and* ***improved yields*** *while expending little capital.*

(Note that this project was updated and expanded from the 120,000 barrel/day figure to 360,000 barrel/day, to be completed in 2015.[5]) The Morningstar webpage also explained in July of 2013 why oil companies are incentivized to change operations to accommodate such cheap crude oil:

> ***Success in the refining business is primarily a function of the difference in the amount the refiner pays for oil and the amount at which it sells the refined product.*** *As such, the short- and long-term risks are dependent on movements in the prices of crude oil and gasoline or diesel. Supply interruptions or increased demand that drive up oil prices, as well as demand destruction or economic slowdown that depress gas prices, are the primary risks.* ***Additionally, the recent strong operating performance is attributable to wide crude differentials.***

Such crude differentials are available for both Bakken and Canadian tar sands crude. The costs can fluctuate, so many refiners, including Tesoro, are looking at both these sources depending on the most current price fluctuations and logistics. Tesoro has evaluated both Bakken and Canadian crude sources, and both these sources are booming compared to existing Tesoro crude sources, which have been dropping.[6]

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[5] Tesoro Savage, Application for Site Certification Agreement (Vancouver Application), Vol. 1, August 29, 2013, http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20I/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%20I.pdf

[6] California's Oil Refiners Double Crude-by-Rail Volumes (1), Lynn Doan May 02, 2014, Bloomberg Business Week, [*"U.S. West Coast refiners including Tesoro Corp. (TSO:US) and Valero Energy Corp. (VLO:US) are developing projects to bring in more oil by rail from reserves across the middle of the U.S. and Canada to displace more expensive supplies. Crude production in PADD 5, which includes California and Alaska, has dropped every year since 2002 while drillers are extracting record volumes from shale in states including North Dakota and*

The Morningstar report also identifies other refinery processes such as vacuum distillation, increased coking, increased product export, and increased yields, as related to the Project. For instance, the analysis identifies a recent Wilmington refinery vacuum distillation unit project allowing increased coking. The vacuum distillation tower was also reported in Bloomberg news in late 2012, with further allusions to Tesoro's plans to integrate Wilmington and Carson operations, which could result in shutdown of Tesoro's fluid catalytic cracking unit (FCC), unit. This further stresses the changes to overall refinery balancing and design which can occur as a result of the changes in crude oil which would be brought in as a result of the ND's pipeline and storage Project.[7]

Heavy, bottom of the barrel portions of crude oil are a much higher proportion in heavier crudes, which result in production of petroleum coke in higher quantities, which the storage project would also enable. The evaluation states:

> *. . . To address these challenges, Tesoro is focusing on improving yields and lowering operating costs at its facilities* ***while increasing export volumes*** *to higher value markets.* ***To improve yields, Tesoro replaced a vacuum distillation unit at its Wilmington facility, which should allow it to upgrade petroleum coke to clean products.*** *. . .*
>
> *In the Pacific Northwest, Tesoro's two refineries, which account for almost 30% of total capacity, are at a disadvantage because of their lack of cokers, resulting in poor yields and large amounts of fuel oil. However, Tesoro's recently completed project to rail upward of 50,000 bpd of discount, light Bakken crude to its Washington refinery, should lead to reduced dependence on waterborne crude and improved margins.*

Increased coking means increased emissions from coking operations. Increased exports have the potential to increase emissions due to refining, storing, and loading products for export. Increased yields of individual product units within the refinery have different characteristics, and must be evaluated specifically, rather than looking at the overall crude oil throughput, since different units have different chemical use and different emissions, which can be impacted even without an increase of crude throughput. All of these are related operations with potentially major impacts not evaluated in the ND.

The Morningstar literature identified the lack of cokers at Tesoro's Pacific Northwest refineries as increasing the need for taking advantage of available coking facilities in California refineries:

> ***Tesoro's refining capacity is concentrated in California. . . .***
>
> *Second, it has invested in rail facilities to move 50 mb/d of Bakken crude west to its Anacortes, Wash., refinery, which has resulted in improved yield and margins.* ***Finally, we expect the imbalance between light and heavy crude in the Mid-Continent will create an opportunity and***

Texas."] http://www.businessweek.com/news/2014-05-02/california-doubles-oil-by-rail-volumes-as-canadian-imports-grow and
Tesoro Seeks More Canadian Crude Oil for Its West Coast Refineries, February 7, 2013, Wall Street Journal, http://online.wsj.com/article/BT-CO-20130207-710688.html

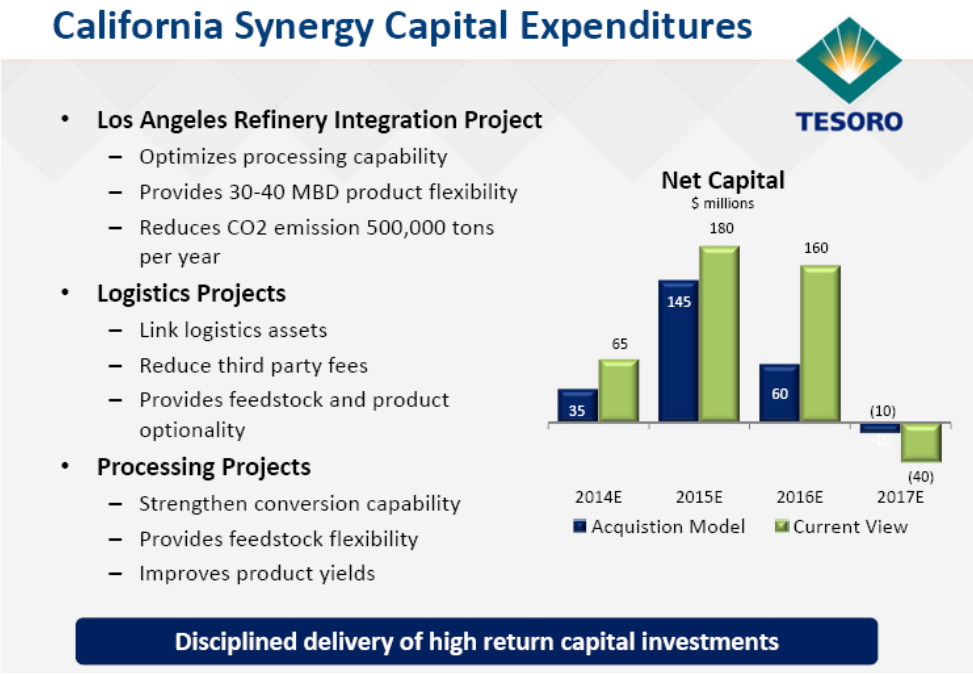
[7] Tesoro Wilmington Refinery Begins Operating New Vacuum Tower, Aaron Clark and Dan Murtaugh - Nov 26, 2012, http://www.bloomberg.com/news/print/2012-11-26/tesoro-wilmington-refinery-begins-operating-new-vacuum-tower.html

economic incentive to rail both types of crude to its three California refineries, increasing their throughput of cost-advantaged crude. *In fact, Tesoro already has plans in place to do so. . . .*

2. Tesoro also published these plans

Tesoro has confirmed these industry findings. For example, a February 2014 Tesoro slideshow[8] on Tesoro's"Presentations" webpage states *"Los Angeles acquisition [BP Carson and terminals and coking] transforms our capabilities,"* providing flexibility in yield, access to "advantaged" crude oil, integrated logistics infrastructure, etc. (Slide 7).

Another slide below (12) identifies the "Los Angeles Refinery Integration Project" (integrating Carson and Wilmington refineries) as optimizing processing capability and "product flexibility":

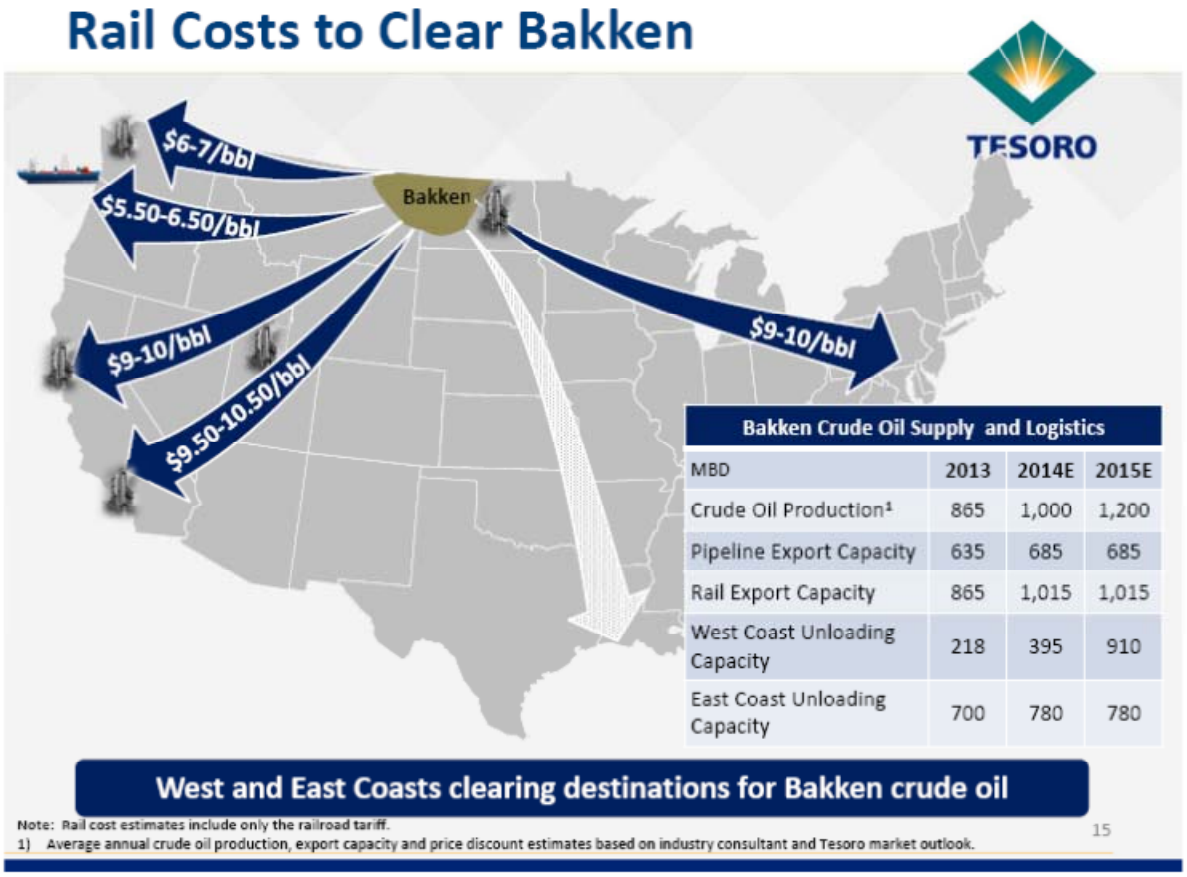


This is followed by a slide describing Tesoro's "Advantaged" feedstock opportunity, ***"Extending the advantaged crude oil to the West Coast,"*** **and changing the Los Angeles operations crude oil feedstock from 15% California Heavy crude to *"Potentially up to 50% California Heavy and Bakken"* crude oil (at Slide 13).**

The slideshow also evaluates the cost of crude by rail directly to West Coast refineries, including Los Angeles, in the following (slide 15), but also states that the cost of rail to the state of Washington, and then by ship to California, is "Competitive with direct rail cost to California" (at Slide 17). Slide 17 also finds that its Washington rail to ship project provides ***"Flexibility to deliver to all West Coast refineries."***

[8] Simmons Energy Conference, *Transformation through Distinctive Performance,* February 27, 2014, http://phx.corporate-ir.net/phoenix.zhtml?c=79122&p=irol-presentations attached

Another key point on Slide 15 as shown below is the massive increase in "West Coast Unloading capacity" from 218 barrels per day (bpd) in 2013, to 395 bpd estimated in 2014, to 910 bpd estimated in 2015. California is the largest share of West Coast Tesoro capacity, and Los Angeles is the largest share of Tesoro California capacity.



Crude oil unloading capacity is the subject of this ND, by unloading crude oil from ship to the expanded pipeline, to the expanded storage tankage. **As a result, it is clear that Tesoro's West Coast plans for bringing Bakken crude into LA will require the increased unloading and storage identified in the Negative Declaration.**

Another very similar version of this slideshow presented a month earlier by Tesoro (January 2014)[9] elucidates further that "Terminaling, Transportation, and Storage" will "Consolidate Tesoro volumes in Southern California distribution system" (and identifies additional impacts in Southern California). Storage capacity is an essential requirement for terminal, transportation, and refining operations. None of the required evaluation of relationships of storage capacity changes to these other processes have been evaluated in the negative declaration, as they should have been.

[9] 2014 Deutsche Bank Energy Conference, January 9, 2014, http://phx.corporate-ir.net/phoenix.zhtml?c=79122&p=irol-presentations (Slide 24), attached



Slide 34 in this second presentation also mentions a plan to decommission the Wilmington refinery's FCC (Fluid Catalytic Cracker) unit. Again, such a change should be identified as part of the whole broad project, either directly, or as part of a cumulative impacts evaluation.

The Slides and previous reports above show that Tesoro has considered different options for transporting crude from North Dakota and Canada to the Los Angeles complex, including rail transport directly to California (despite the ND's dismissal of rail as potentially connected to this Project). Tesoro has lately settled on the rail to Washington and ship to Long Beach option. However, if conditions change (for example, if the Washington hub does not proceed due to public opposition), Tesoro could instead take advanatage of the new Tankage's proximity to the nearby railline that traverses both its LA refineries. For example, the new Tesoro pipeline continues past the new storage tanks, and ends next to the railway that transects the refinery, as discussed later.

III. Potential impacts of the Project are large

A. Changes in crude oil feedstock facilitated by the Project have significant impacts

1. Waxy Bakken crude oil requires special handling and creates problems of transfer in both marine vessels and refinery storage tanks and requires chemical dispersants

An article from Hydrocarbon Processing -- *Innovative Solutions for Processing Shale Oils*[10] -- identifies problems in processing oils such as Bakken shale, due to high variability in crude qualities, waxy buildup (paraffinic content), etc. This article specifically identified transfer to refinery tankage as problematic:

> ***The paraffin content of the shale oils is impacting all transportation systems.*** *Wax deposits have been found to coat the walls of railroad tank cars, barges and trucks. Waxy deposits in pipelines regularly require pigging to maintain full throughput. Bakken shale oil is typically transported in railcar, although pipeline expansion projects are in progress to accommodate the long-term need. These railcars require regular steaming and cleaning for reuse. Similar deposits are being encountered in trucks being used for shale oil transportation.* ***The wax deposits also create problems in transferring the shale oils to refinery tankage. Fig. 4*** *shows samples of deposited wax collected from pigged pipelines*[11] *in shale oil service. [emphasis added]*

The article provided photos (entitled "waxy deposits removed from shale oil buildup") which graphically depict the more obvious problems with Bakken crude:



The article also identified multiple chemical dispersants used to mitigate these problems not only during transportation, but also within refineries where these shale oils are processed.

> *To control deposition and plugging in formations due to paraffins, the dispersants are commonly used. In upstream applications, these paraffin dispersants are applied as part of multifunctional additive packages where asphaltene stability and corrosion control are also addressed simultaneously.*

These chemicals must be identified in a full EIR in order to assess the impacts of their use. The article also found that steam cleaning is used to remove such deposits from railcars. Such activities should be identified and associated impacts evaluated. Impacts within the refinery must also be evaluated for safety risks.

2. Bakken crude oil also causes fouling of preheaters, heat exchangers, and furnaces, refinery corrosion, and can shutdown refinery units

[10] Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013, attached http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html

[11] A "pig" is launched through a iline until it reaches a rece

The Hydrocarbon Processing article found that asphaltene destabilization can occur when blending shale oil with heavier crudes. This is precisely the kind of blending that could occur due to the Project, since Tesoro has stated it plans to change the crude slate in California from 15% California Heavy crude to *"Potentially up to 50% California Heavy and Bakken"* (see earlier in this comment).

These problems result in fouling of the cold preheat train, fouling of hot preheat exchangers and furnaces, problems in transportation, storage, refinery corrosion, and crude unit shutdowns. These oils are also extracted through fracturing, which have additional and major impacts on water, air, and the global climate. The article finds:

> *The refining of shale oil (also known as tight oil) extracted through fracturing from fields such as Eagle Ford, Utica and* ***Bakken*** *has become prevalent in many areas of the US. Although these oils are appealing as refinery feedstocks due to their availability and low cost, processing can be more difficult.*
>
> ***The quality of the shale oils is highly variable. These oils can be high in solids with high melting point waxes.*** *The light paraffinic nature of shale oils can lead to asphaltene destabilization when blended with heavier crudes. These compositional factors have resulted in cold preheat train fouling, desalter upsets, and fouling of hot preheat exchangers and furnaces. Problems in transportation and storage, finished-product quality, as well as refinery corrosion, have also been reported. Operational issues have led to cases of reduced throughput and crude unit shutdowns. The problems encountered with shale oil processing and possible prediction and control strategies will be presented.*
>
> [Emphasis added throughout and below]

The article found use of shale oils was particularly problematic when blended with heavy crudes, which is admittedly planned by Tesoro for its California refinery operations. This blending can cause agglomeration of large molecules onto surfaces inside refinery units which can crack and leave coke-like deposits if the surfaces are hot.[12] Coke deposits lead to poor operation and can cause shut down of units before planned maintenance periods. All these problems require special handling and planning at the refinery. In addition, the article found shale oils to be highly variable in certain characteristics including for example, its solids content, and others. The article states:

> *Due to their paraffinic nature, mixing shale oil with asphaltenic oil leads to destabilization of the asphaltene cores. Asphaltenes are polar compounds that influence emulsion stability. Once the asphaltenes destabilize, they can agglomerate, leading to larger macro-molecules. On hot surfaces, agglomerated asphaltenes easily crack or dehydrogenate and gradually form coke-like deposits.*

[12] Coke is a petroleum product that is mostly the carbon leftover after making gasoline from crude oil. Coke is a fuel, and similar to coal, as an energy source that results in high GHG and criteria pollutant emissions, and significant heavy metal content.

3. Bakken crude is volatile and explosive and these characteristics were not evaluated in the ND

Unfortunately, Bakken crude oil has been fatally demonstrated as very volatile and explosive, as in the case of the tragic explosions at Lac Megantic in Canada, and in other instances.

The U.S. Department of Transportation Pipeline and Hazardous Material Safety Administration issued a safety alert regarding the transport of this type of crude oil in January of 2014, finding that **whether it was transported in railcar or other mode of transport, it represents unique hazards of explosion, fire, and corrosivity,** requiring additional testing, handling, and public information for first responders.[13] Entrained gases require additional testing.

> ***The Pipeline and Hazardous Materials Safety Administration (PHMSA) is issuing this safety alert to notify the general public, emergency responders and shippers and carriers that recent derailments and resulting fires indicate that the type of crude oil being transported from the Bakken region may be more flammable than traditional heavy crude oil.***
>
> *Based upon preliminary inspections conducted after recent rail derailments in North Dakota, Alabama and Lac-Megantic, Quebec involving Bakken crude oil, PHMSA is reinforcing the requirement to properly test, characterize, classify, and where appropriate sufficiently degasify hazardous materials prior to and during transportation. Proper characterization will identify properties that could affect the integrity of the packaging or present additional hazards, such as corrosivity, sulfur content, and dissolved gas content. These characteristics may also affect classification.*
>
> ***PHMSA stresses to offerors the importance of appropriate classification and packing group (PG) assignment of crude oil shipments, whether the shipment is in a cargo tank, rail tank car or other mode of ransportation.*** *Emergency responders should remember that light sweet crude oil, such as that coming from the Bakken region,is typically assigned a packing group I or II. The PGs mean that the material's flashpoint is below 73 degrees Fahrenheit and, for packing group I materials, the boiling point is below 95 degrees Fahrenheit.* ***This means the materials pose significant fire risk if released from the package in an accident.***
>
> *. . . Based on initial field observations, PHMSA expanded the scope of lab testing to include other factors that affect proper characterization and classification such as* ***Reid Vapor Pressure, corrosivity, hydrogen sulfide content and composition/concentration of the entrained gases*** *in the material. The results of this expanded testing will further inform shippers and carriers about how to ensure that the materials are known and are properly described, classified, and characterized when being shipped. In addition, understanding any unique hazards of the materials will enable offerors, carriers, first responders, as well as PHMSA and FRA to identify any appropriate mitigating measures that need to be taken to ensure the continued safe transportation of these materials.*

This is a major problem with the Project, at the Marine Terminal in Long Beach, in the expanded pipeline to the refinery, in the storage tanks at the refinery, and in the refinery where it will be

[13] The U.S. Department of Transportation Pipeline and Hazardous Material Safety Administration, January 2, 2014, http://phmsa.dot.gov/pv_obj_cache/pv_obj_id_111F295A99DD05D9B698AE8968F7C1742DC70000/filename/1_2_14%20Rail_Safety_Alert.pdf , attached

used. It was a major failure of the ND to ignore these impacts, which even without the other impacts, would require an EIR.

4. Bakken crude refining can also increase levels of acutely hazardous and corrosive Hydrogen Sulfide in the refinery

The Hydrocarbon Processing article also identified increased levels of extremely hazardous hydrogen sulfide (H2S) gas as a problem associated with shale oil. Furthermore, when scavenging agents are used to reduce H2S presence, these can cause corrosion and form solid deposits inside processing units. The article states:

> ***Several shale oil production locations have high H_2S loading.*** *To ensure worker safety, scavengers are often used to reduce H_2S concentrations. The scavengers are often amine-based products-—methyl triazine, for instance—that are converted into mono-ethanolamine (MEA) in the crude distillation unit (CDU). Unfortunately, these amines contribute to corrosion problems in the CDU. Once MEA forms, it rapidly reacts with chlorine to form chloride salts. These salts lose solubility in the hydrocarbon phase and become solids at the processing temperatures of the atmospheric CD towers and form deposits on the trays or overhead system.* ***The deposits are hygroscopic, and, once water is absorbed, the deposits become very corrosive.*** *These physical properties are responsible for the problems that are being experienced by refineries handling shale oils.*

Hydrogen sulfide is deadly, corrosive, causes odor complaints when released, and its increase in the refinery certainly requires specific evaluation that was absent in the ND.

A report by Bakkenshale.com found:[14]

> *Is the Bakken producing higher volumes of H2S? That's the question you have to ask yourself when you see pipelines implementing H2S standards for the first time.*
>
> *On May 8, Enbridge submitted an emergency application to the Federal Energy Regulation Commission (FERC) asking to amend its conditions of carriage to 5 ppm of H2S or less. If accepted, Enbridge would have the right to reject crude with higher levels of H2S. . . .*
>
> ***Enbridge acted after it found concentrations of 1,200 ppm in a crude tank at its Berthold Terminal. 20 ppm is the limit allowed by OHSA and an average of 10 ppm of exposure is all that is allowed over an 8-hour work day.***
>
> *Both Plains Marketing and Murex Petroleum objected to the FERC application, but it looks as if they solved their differences when Enbridge notified FERC it wasn't planning an outright ban on crude with higher H2S concentrations. The two companies weren't against the change, but were afraid they couldn't comply in the time frame planned.*

Thus hazardous and corrosive sulfur compounds can either be part of the crude characteristic, but also can be transported with otherwise low sulfur crude oil. The Chemical Safety Board report also identified that H2S was a particularly aggressive corrosive agent.[15] These issues must be

[14] May 30, 2013, http://bakkenshale.com/pipeline-midstream-news/bakken-producing-sour-gas-h2s-problem-in-north-dakota/

[15] *Id.* at p. 33

evaluated through a full EIR to prevent severe safety risks associated with crude slate changes.

The problem of sulfur corrosion increasing accident risk was unfortunately born out at Chevron Richmond in California last August, when a major explosion barely avoided killing 19 workers, but did send 15,000 neighbors to the hospital, after a huge black plume traveling many miles through the Bay Area resulted from the crude unit explosion, which burned for many hours.

Steelworkers testified at the U.S. Chemical Safety Board hearing on the Chevron explosion that such sulfur corrosion is a statewide problem at California oil refineries.[16] The Chemical Safety Board found the Richmond accident was caused by sulfur corrosion that Chevron had been aware of, and had repeatedly ignored, and the report showed that sulfur content had increased. The photos below show the heavy impact not only in Richmond, but across the San Francisco Bay Area due to this accident.

A discussion of corrosion issues at oil refineries due to increased sulfur content in crude oil, and other important related issues was provided in the attached report of Greg Karras on the Phillips 66 *Rodeo* refinery EIR.[17] Also refer to the previously cited report of Dr. Fox on impacts of use of "advantaged" crude are also in process.

These reports demonstrate in further detail the impacts of corrosion demonstrated by the US Chemical Safety Board, causing the massive explosion in August of 2012 in the Chevron Richmond refinery, pictured below. The U.S. Chemical Safety Board report is also available.[18] The significance of the air pollution impacts caused by the Chevron explosion are self-explanatory, in the photos below of the August 2012 explosion caused by the refinery corrosion.





[16] U.S. Chemical Safety Board transcript of public hearing on Chevron Richmond, CA August 2012 explosion and fire, page 225, http://www.csb.gov/assets/1/19/0503CSB-Meeting.pdf

[17] Expert Report of Greg Karras, CBE, 4 September 2013, Regarding the Phillips 66 Company Propane Recovery Project Draft Environmental Impact Report released in June 2013 by the Contra Costa County Department of Conservation and Development

[18] Interim Investigation Report, Chevron Richmond Refinery Fire, (which as adopted at the July public hearing) available at: http://www.csb.gov/assets/1/19/Chevron_Interim_Report_Final_2013-04-17.pdf



5. Another "advantaged" crude oil from Canadian Tar Sands that Tesoro plans to import also causes major impacts

As previously identified, Tesoro plans to bring cost advantaged crude oil to Los Angeles, both light and heavy, including heavy Canadian tar sands crude. Canadian tar sands crude is even cheaper than Bakken, as discussed by Bloomberg about Tesoro's plans to use the cost advantage of Canadian heavy crude in California.

> ***U.S. West Coast refiners including Tesoro Corp. (TSO) and Valero Energy Corp. (VLO) are developing projects to bring in more oil by rail from reserves across the middle of the U.S. and Canada to displace more expensive supplies.*** *Crude production in PADD 5, which includes California and Alaska, has dropped every year since 2002 while drillers are extracting record volumes from shale in states including North Dakota and Texas.*
>
> *The surging flows of domestic oil to California "reflect a continuing improvement in crude-by-rail receiving facilities here," David Hackett, president of Stillwater Associates, an energy consultant, said by phone from Irvine, California.*
>
> ***Lower Costs***
> *Crude from North Dakota and Canada trades at a discount to Alaska North Slope oil, which rose 36 cents to $107.78 a barrel at 9:09 a.m., data compiled by Bloomberg show.* ***Western Canada Select, a heavy, sour blend, gained 36 cents to $82.88.*** *North Dakota's Bakken crude also gained 36 cents to $95.28. It costs $9 to $10.50 a barrel to send North Dakota's Bakken oil by rail to California, according to Tesoro, the West Coast's largest refiner.*

Of course, tar sands crude oil causes major environmental damage during its mining in Canada, as described by the World Resources Institute, which rather mildly states the severe impacts:[19] "*The local and regional environmental impacts of heavy oil and tar sands production can include: significant water consumption, massive earth moving and ecosystem disturbance, increased criteria and other air pollution, and release of heavy metals and toxic materials."*

But the ND must account for the local Los Angeles region, and global impacts. Canadian tar sands are even heavier than most heavy conventional crudes (higher carbon content, requiring additional energy to process and increasing emissions) and have higher sulfur content. Contaminants must be removed during refining, which increases hazardous materials present within the refinery and can lead to dangerous corrosion within refinery operations units. These

[19] http://www.wri.org/publication/content/10339

also increase energy needed for refining, resulting in higher greenhouse gas and smog-precursor emissions. The corrosion hazard is increased due to the higher sulfur content, increasing refinery accident risk identified by the US Chemical Safety Board in the last section.

The ND failed to evaluate the obvious increases in desulfurization processes within the refinery due to higher sulfur content, as well as additional cracking, coking, and additional use of hydrogen, all of which require more energy and increase criteria and toxic pollutant emissions. This is a major and obvious area of impacts that was completely ignored in the ND, especially without any baselines provided.

An Oil & Gas Journal article ***Special Report: Refiners processing heavy crudes can experience crude distillation problems*** (Oil and Gas Journal),[20] also identified the need for additional desalting and temperature controls in order to process unconventional crude oils. This and the other articles identified many problems with processing unconventional crudes, emphasizing that it is not just *volume* of crude throughput that determines environmental impacts, but also the characteristics or *quality* of the crude oils. The Oil and Gas Journal article (***Refiners processing heavy crudes can experience crude distillation problems)*** also identified a number of differences in the content of unconventional crudes (such as tar sands and others):

> *Heavy crudes have much higher microcarbon residue (MCR), asphaltenes, and metals. As mandated refinery gasoline and diesel pool sulfur specifications take effect, minimizing cat feed hydrotreater (CFHT) feed contaminants becomes more important. In some cases, vanadium in the CFHT feed has increased from less than 1 ppm to 5-10 ppm with heavy Venezuelan crudes.*[1] ***High feed-stream contaminants can reduce run length to less than half the planned turnaround interval.*** *Optimizing the atmospheric column flash-zone and wash section, and the vacuum unit design can reduce CFHT feed vanadium by 30-40%. . . .*
>
> *Heavy crudes have higher viscosities, some have higher salt content, several have high naphthenic acid content, and they are all more difficult to distill than lighter crude blends. Some upgrader crudes also have lower thermal stability than conventional crudes and higher fouling tendencies due to the increased likelihood of asphaltene precipitation. . . .*
>
> *High chlorides to the atmospheric heater generate large quantities of hydrochloric acid (HCl). Severe fouling in the crude column's top, rapid fouling and corrosion in the atmospheric condenser system, and severe overhead line corrosion often reduce crude runs and unit reliability.*

A complete inventory and evaluation of differences in the crude oils to be processed at the refinery due to the Project changes needs to be evaluated for environmental impacts.

Additional emissions during the transport, piping, tank loading, and in refinery operation from volatile diluents used with expanded tar sands crude oils have not been identified, and should be, with emissions quantified. Diluents can include volatile and toxic compounds such as BTEX

[20] Oil and Gas Journal, Special Report: Refiners processing heavy crudes can experience crude distillation problems, 11/18/2002, available at http://www.ogj.com/articles/print/volume-100/issue-47/special-report/special-report-refiners-processing-heavy-crudes-can-experience-crude-distillation-problems.html , attached

VOCs (Benzene, Toluene, Ethylbenzene, and Xylene).[21] In addition to the highly reactive ozone-precursor quality of such diluents, they need to be identified and evaluated as toxic air contaminants, due to carcinogencity and other health impacts, as well as any potentially explosive compounds.

6. The Project Description failed to provide baseline data on the current crude oil slate, to compare it to the "advantaged" crudes the Project allows, and to identify the potentially significant impacts of such changes

The ND did not provide baseline information about the crude oil slate. This is a major omission especially given Tesoro's public acknowledgement of the key nature of its planned switch to cost-advantaged crude oils such as Bakken crude (or Canadian tar sands). The ND assumes that if general *types* of crude oil and products remain the same, then the Project cannot cause changes with significant impacts. But this is demonstrably false – changes in the crude slate can cause major impacts regardless of existing AQMD permit conditions, even if volumes don't change. Tesoro should have provided this baseline information.

Through outside sources we can find some very basic information about the recent crude slate at Tesoro's Wilmington and Carson refineries:

- The Alaska Business Monthly stated that the Carson refinery formerly owned by BP has recently (2012) processed significant levels of Alaska North Slope crude (ANS).[22]

  "According to Chuck Coulson, BP's manager for midstream operations, BP refines "virtually" all of its Alaska crude at its two West Coast refineries: Cherry Point in Puget Sound and Carson refinery in L.A. County. ***BP runs a mix of Alaska North Slope crude and crude from other countries at both facilities.***

- The BP website stated in 2013 that the Carson facility processed **ANS, Middle Eastern, and West African crude**:[23]

  "It processes crude oil from Alaska's North Slope, the Middle East and West Africa."

- Tesoro's SEC report identified in California refineries:[24]
  "Our California refineries run a significant amount of ***South American heavy crude oil ("Oriente"), San Joaquin Valley Heavy ("SJVH") and light crude oil from Iraq ("Basrah"),*** *which continued to be priced at a discount to Brent throughout 2013."*

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[21] Comments of NRDC on the Notice of Intent to Adopt a Mitigated Negative Declaration for the Valero Crude by Rail Project, July 1, 2013, on impacts of diluents and other important impacts related to the Valero Benicia crude by rail project in common with the Phillips 66 Los Angeles refinery complex, http://switchboard.nrdc.org/blogs/dbailey/NRDC%20comments%20letter%20on%20Notice%20of%20Intent%20to%20Adopt%20a%20Mitigated%20Negative%20Declaration%20for%20the%20Valero%20Crude%20by%20Rail%20Project.pdf

[22] Following North Slope Crude from the Ground to the Gas Station, May 2012 article, http://www.akbizmag.com/Alaska-Business-Monthly/May-2012/Following-North-Slope-Crude-From-the-ground-to-the-gas-station/?utm

[23] BP Completes Sale of Carson Refinery and Southwest U.S. Retail Assets to Tesoro Release date: 03 June 2013, http://www.bp.com/en/global/corporate/press/press-releases/bp-completes-sale-of-carson-refinery-and-southwest-u-s--retail-a.html

[24] http://biz.yahoo.com/e/140224/tso10-k.html

Tesoro's 2013 SEC report[25] also provides a general picture of Tesoro's crude slate in California from 2011 to 2013 (but not at the individual refineries):

> ***Our refineries process both heavy and light crude oil.*** *Light crude oil, when refined, produces a greater proportion of higher value transportation fuels such as gasoline, diesel and jet fuel, and as a result is typically more expensive than heavy crude oil. In contrast, heavy crude oil produces more low value byproducts and heavy residual oils. These lower value products can be upgraded to higher value products through additional, more complex and expensive refining processes. Throughput volumes by feedstock type and region are summarized below (in Mbpd):*

	2013		*2012*		*2011*	
California	*Volume*	*%*	*Volume*	*%*	*Volume*	*%*
Heavy crude	*178*	*42*	*151*	*62*	*156*	*65*
Light crude	*206*	*49*	*67*	*28*	*60*	*25*
Other feedstocks	*38*	*9*	*24*	*10*	*25*	*10*
Total	*422*	*100*	*242*	*100*	*241*	*100*

Tesoro's chart shows Heavy Crude feedstock lowering from 65 to 42%, with Light Crude increasing from 25 to 49%, and other unidentified feedstocks remaining about the same. It appears that at least half of 2013 did not include the BP purchase, which increased the throughput greatly.

The US EIA (Energy Information Administration) provides data on foreign crude imports, but not on refineries' domestic crude use. The following table provides an example of US EIA Tesoro data for the month of March 2014. The ND should provide current baseline information from 2010 to the present, including both imported and domestic crude slate for each of the Wilmington and Carson refinery portions.

[25]Tesoro's US Securities and Exchange Commission (SEC), Annual 10-K report, for 2013, at p. 5, http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0CDIQFjAC&url=http%3A%2F%2Fphx.corporate-ir.net%2FExternal.File%3Fitem%3DUGFyZW50SUQ9NTM1NDc5fENoaWxkSUQ9MjIzNTc3fFR5cGU9MQ%3D%3D%26t%3D1&ei=UuGUU7CZO8qOqAbW7ILgAg&usg=AFQjCNFro71tQanqMTIBnERVK-mEduvJPQ&sig2=-yTQ5qcuA3RSmO-yIIdOqQ&bvm=bv.68445247,d.b2k

US EIA Data, Tesoro Corp Crude Oil Imports, Port City: Los Angeles, CA, Port Code 2704, Reporting Period March 2014. Downloaded 6/8/2014 by Jmay, CBE, from US EIA Excel file at: http://www.eia.gov/petroleum/imports/companylevel/ Totals and weighted averages are added				
CNTRY_ E2NAME	**QUANTITY (thousands of bpd)**	**SULFUR**	**API GRAVITY**	**PCOMP_SNAM**
ANGOLA	230	0.4	25.6	CARSON
ANGOLA	321	0.45	25.6	CARSON
ANGOLA	342	0.42	25.6	CARSON
ANGOLA	502	0.45	25.7	CARSON
COLOMBIA	379	0.7	28.4	CARSON
IRAQ	150	2.59	32	CARSON
IRAQ	257	2	28.9	CARSON
IRAQ	294	2.58	32	CARSON
IRAQ	356	3.13	29.3	CARSON
IRAQ	693	3.08	29.3	CARSON
IRAQ	802	2.61	31.9	CARSON
TOTAL	4326			
CARSON	Weighted Average:	1.82	28.77	
CANADA	245	3.46	24.1	WILIMINGTON LOS ANGELES
ECUADOR	396	1.95	19.9	WILIMINGTON LOS ANGELES
TOTAL	4326			
WILMINGT	Weighted Average:	2.53	21.51	

The data above shows that out of crude imports, almost 38% of the Wilmington refinery in March was already from Canada, with a very high sulfur content – indicating that Wilmington is already importing substantial Canadian tar sands crude. However, the weighted average sulfur content for that month for *imports* of Tesoro was about 2.53% sulfur (for imports only, since the EIA data does not provide domestic crude use information by refinery), much lower than the Canadian crude (shown at 3.46%). Increasing the Canadian source further will increase the average sulfur content.

The Carson portion of the Los Angeles refinery complex on the other hand, had a much lower weighted sulfur average (1.82%), and lighter crude oil (API gravity is a reverse scale, so that higher gravity indicates lighter crude). The former BP Carson refinery is designed for a lighter feedstock compared to the Wilmington refinery. The location of the new storage tanks, with the proposed pipeline expansion through the refinery, and continuing to the corner of the Wilmington operation, could be used to source either the Wilmington OR the Carson operations.

Having a major increase in tankage and connection via rail to Washington and via ship to Long Beach, allows Tesoro to increase either lighter Bakken OR heavy Canadian tar sands, both "advantaged" crude oils, both with serious environmental impacts.

There is an array of public information available about the potential impacts at refineries using different crude oil slates. In one example, the International Council on Clean Transportation's 2013 Report: *Effects of Possible Changes in Crude Oil Slate on the U.S. Refining Sector's CO2 Emissions, Final Report*[26] found not only that refinery CO2 emissions varied considerably

[26] March 29, 2013, http://www.theicct.org/sites/default/files/publications/ICCT_Refinery_GHG_Study_Proj_Report_Apr2013.pdf

depending on the type of crude oil processed, but identified the changes in yields of refinery products. Further, an excerpt from this report shows that Bakken shale oil (generally considered on *average* a light and low sulfur crude oil), can vary in quality, and can be heavy,[27] so it should not be assumed that imported Bakken crude would always be lighter than the current slate.

	2011	Crude Slate							
Inputs & Outputs	Calib	Base	Ext. Heavy	Very Heavy	Heavy	Mid Expan	Import Indep	Light	Very Light
Inputs (K b/d)									
Crude Oil	14,712	14,314	14,383	14,664	14,540	14,327	14,354	14,131	14,057
C4s	234	170	246	170	170	170	170	170	170
NGL, Naphtha & Gas Blndstk.	209	302	302	302	302	302	302	302	302
Heavy Gas Oil & Resid	661	474	474	474	474	474	474	474	474
Purchased Energy									
Electricity (MM Kwh/d)	172	167	190	183	177	170	167	155	154
Natural Gas (K foeb/d)	612	642	783	715	703	665	664	631	636
Outputs (K b/d)[1]	**15,682**	**15,105**	**15,113**	**15,108**	**15,101**	**15,094**	**15,089**	**15,082**	**15,082**
Light Gases	583	542	550	545	538	531	526	519	519
Aromatics, Naphthas, & Av Gas	259	241	241	241	241	241	241	241	241
Hydrocarbon Gasoline	7,623	6,764	6,764	6,764	6,764	6,764	6,764	6,764	6,764
Jet Fuel	1,493	1,565	1,565	1,565	1,565	1,565	1,565	1,565	1,565
Diesel Fuel	4,471	4,946	4,946	4,946	4,946	4,946	4,946	4,946	4,946
Resid & Asphalt	895	715	715	715	715	715	715	715	715
All Other Liquids	358	332	332	332	332	332	332	332	332
Coke	590	690	1,015	1,109	940	731	692	456	361
Sulfur (K s tons/d)	20	19	23	29	26	20	21	13	12

The specific CO2 emissions in this study have been refuted by a peer reviewed CBE study published in Environmental Science and Technology[28] which showed that the greenhouse gas emissions impacts of heavy crude oil are much higher than shown in this oil industry-sponsored study.

The CBE paper documented that the impacts of crude oil density or API gravity (heaviness of crude oil) and sulfur content (which usually accompanies heavy crude) on greenhouse gas emissions strongly predicts high energy use at oil refineries. High energy use means high carbon dioxide emissions from this processing. This high energy intensity drove a 39% increase in greenhouse gas emissions across regions and years at oil refineries.

However, even the industry study showed in the chart above that crude quality impacts the volume of individual products *produced* by the refinery. This is also a common-sense conclusion – it is obvious that lighter crude oils produce higher volumes of gasoline, and that heavier crude oils produce more bottoms and more coking. These changes cause a multitude of environmental impacts that the District is well aware of. But the ND assumes contrary to these fundamental principles, that because throughput is expected not to change, and heat input is expected to be the same at the crude unit at the front end, that no changes will occur downstream in the refinery. This is plainly incorrect and must be re-assessed (in addition to the problem of lack of baselines in the ND).

[27] In the Table entitled *Exhibit 3: Composition of Alternative Crude Slates, by Crude Type* (K b/d), showed 720 thousand barrels per day of Bakken crude oil in the Heavy Crude designation column, 37th page

If light, low sulfur Alaska North Slope (ANS) crude oil, which is continually lowering in - production, is displaced with extremely heavy, high sulfur Canadian tar sands crude oil, clearly that would increase sulfur content in the refinery, increase corrosion hazard and potential impacts of H2S gas, and require additional energy to process the heavy crude.

If Bakken crude oil were to replace, for example, ANS at the Tesoro refineries, this may or may not be comparable to ANS crude *in gravity and sulfur content*. (since Bakken is acknowledged as extremely variable). However, even if the Bakken crude were light, its high paraffin content described above, can cause waxy, dangerous buildup in transport, in the refineries, can be accompanied by toxic diluents, and explosion hazards (a la Lac Megantic explosion in Canada).

If Bakken is mixed with heavy crudes, asphaltene destabilization, preheater fouling, desalter upsets, unwanted coking, etc., identified earlier in the Hydrocarbon Processing article, can occur. These impacts can cause dangerous shutdowns and accidents. The specific changes must be identified to provide an accurate Project Description, to enable a full evaluation of potential impacts.

If instead, which may be the most likely case, heavy Canadian Select would replace California heavy crude at the Wilmington facility, then sulfur content and API gravity goes up considerably, causing increased presence of H2S and increased energy use; while the Bakken imports would go to the Carson portion of the refinery complete, which is designed to handle lighter crude, but introducing the documented problems associated with Bakken characteristics that are not present in, for example, Alaskan crude.

Other impacts aside from CO2 emissions and energy use were also described in the International Council's report on impacts of varying crude slates. The table entitled Exhibit 11 inserted on the next page from the International Council report described above, identified varying refinery *product outputs* caused by varying *crude oil slate inputs*. In other words, the amount of gasoline, diesel, jet fuel, coke, sulfur, light gases, naphtha, resid, and aromatics produced at the refinery varied depending on the variation of crude oils into the refinery.

That means that the impacts associated with each of these different operations change with different crude oil inputs, and these impacts must be evaluated for the Tesoro project, after providing the baseline crude slate, and comparing it to the proposed potential changes in crude slate facilitated that the new Project allows. Some refinery processes involve light ends (which may for example have high benzene content, a known carcinogen), others involve heavy refinery components (which may for example be associated with higher particulate matter emissions, which increase death rates in the population). Others have high levels of odorous and hazardous sulfur compounds, or may increase fire or explosion risk. The pieces of the refinery are not interchangeable, and modifications to crude slate have impacts on the individual components of the refinery which should have been identified.

A report by Dr. Phyllis Fox on a crude by rail project to the Valero Benicia California refinery identified many impacts due to switches to "advantaged" crude oils, including increased metals, increased use of toxic BTEX compounds, and many other impacts in transportation and at the

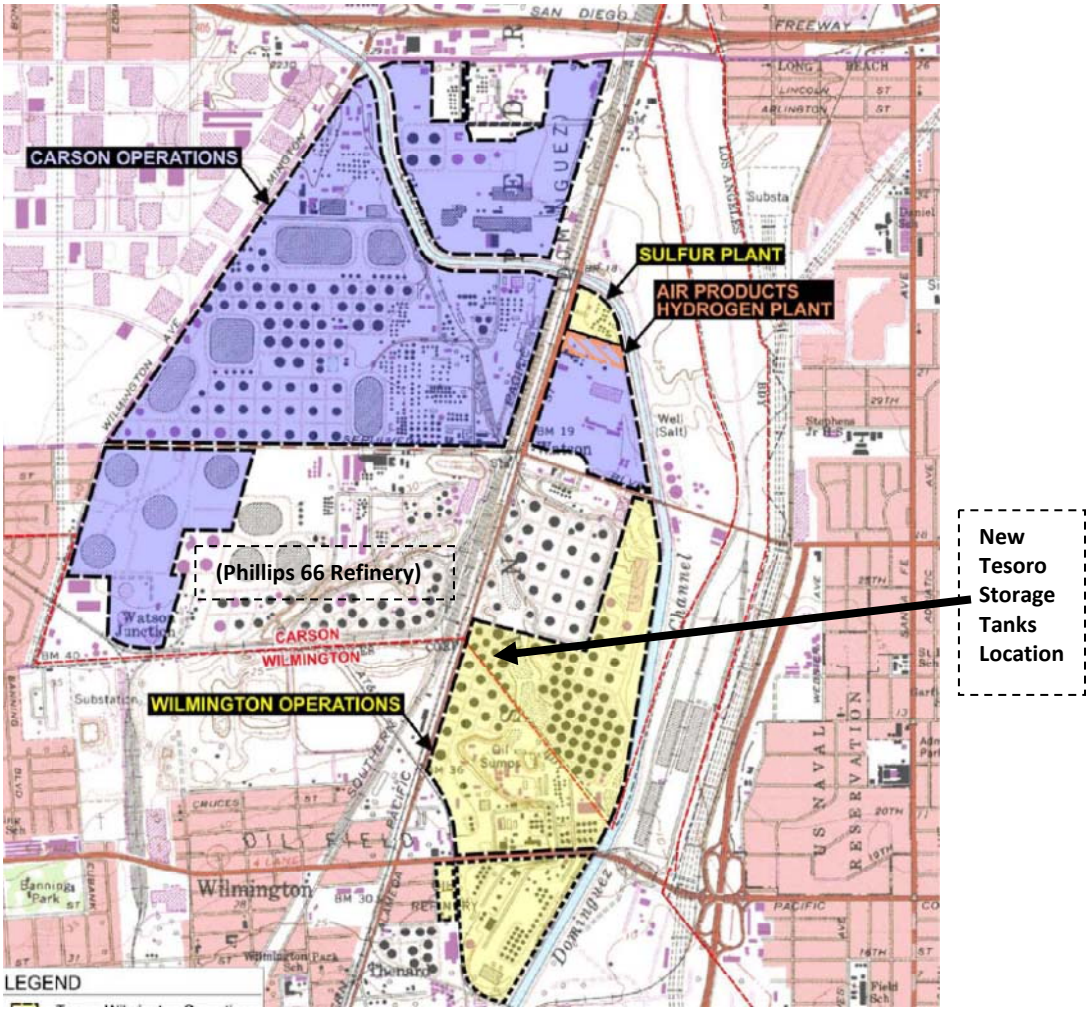
refinery due to use of changing crude slates.[29] All the issues identified in this report should be evaluated for the Tesoro ND.

CEQA provides requirements for clear project descriptions and potential impacts. Even if Tesoro has permits that allow variations in crude oil types, if those variations can cause significant impacts, they still must be identified and evaluated under CEQA even if allowed by current limited permit conditions. CEQA provides additional protections not necessarily covered by AQMD permit conditions, and this kind of data must be available and transparent for the public CEQA process to be carried out.

[29] Comments on the Initial Study / Mitigated Negative Declaration, Valero Benicia Crude by Rail, June 1, 2013, Dr. Phyllis Fox, attached, http://www.ci.benicia.ca.us/vertical/sites/%7B3436CBED-6A58-4FEF-BFDF-5F9331215932%7D/uploads/Report_by_Dr._Phyllis_Fox.pdf

B. Integrating the Wilmington and Carson refinery units and logistics operations is related to the Project, and has the potential to cause major impacts

This map from the Negative Declaration shows the close proximity of the **Tesoro Wilmington and Tesoro Carson refinery operations**, with many residences shown in pink surrounding these facilities (and with labels added for the new Tesoro storage tanks, and the Phillips 66 refinery, next door):



When Tesoro purchased the BP Carson refinery, it planned to take advantage of marine operations to allow changes in crude oil feedstock to feed into the whole refinery complex, and specifically planned to integrate the Carson and Wilmington refineries and the Tesoro and BP "logistics" assets (which provide transportation and storage of feedstocks and products).

Tesoro planned to transfer intermediate feedstock to Carson's cokers and other changes, facilitated by the new storage tank expansions. Tesoro also planned to use BP terminals / "logistics" assets for its own materials, and even to use these terminals to sell excess capacity to

third parties (not even mentioned in the ND). Tesoro should have identified these operations for the ND evaluation. Tesoro has further stated:[30]

> *Integrating the BP assets, specifically the logistics, is expected to drive significant value throughout the West Coast system.* ***The Carson refinery has the only very large crude carrier, or VLCC, capable to dock on the West Coast. We will be able to leverage the broader crude oil sourcing optionality and reduce long-haul shipping costs throughout the Tesoro West Coast system.***
>
> *VLCC freight economics on a per barrel basis typically reduce long-haul shipping costs by between $1 and $2 per barrel.* ***Having this capability will allow us to source more economic alternatives to Alaska North Slope crude oil, which has been a significant component of that Carson refinery's historical crude oil slate. We also anticipate benefiting from Carson's two additional cokers, allowing us to further optimize intermediate feedstock transfers between our refineries.*** *We expect feedstock optimization synergies to account for 40% to 45% of the fully-realized synergies.*
>
> *The primary focus of product synergies is delivering the combined regional production sales volumes to end users in the most efficient way possible. Today, Tesoro uses third-party logistics assets to distribute a significant amount of our product volume.* ***Post close, we intend to drive much of that volume through BP's logistic asset, which have excess capacity. In fact, under the operation of Tesoro Logistics, we feel we can drive additional third-party volume through the combined, historically proprietary, logistics network.*** *We expect these cost improvements to account for 15% to 20% of the total synergies.*
>
> ***As we look at the potential for operating synergies, we are confident that significant value can be created through the combination and reconfiguration of the Carson and Wilmington refineries.*** *One expected benefit is increased clean product yields and greater flexibility between gasoline and distillate production, with a focus on distillates. We expect a combined shift of about 25% in our capability to supply market demand for diesel. With about 10% coming from optimizing the combined assets and the remaining 15% resulting from capital investment. This will allow Tesoro to meet the growing demand for distillate fuel on the West Coast. In addition to our plan to lower manufacturing costs in California prior to the acquisition, we also plan to lower costs as a result of the combined operations.*

This discussion and others documented earlier in this comment also show that the overall "logistics" capacity must be evaluated in total, since increased storage in one part of the Tesoro properties can further free up capacity in other parts of its local complex, and also facilitate third party activities and the "reconfiguration" of the two refineries described by Tesoro.

The previously cited Tesoro February 2014 report to the SEC also again identified the integration of the refineries, the "Logistics" operations, and marketing operations.

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[30] Thomson Reuters Streetevents Edited Transcript, TSO - Tesoro Corporation to Purchase BP's Fully Integrated Southern, California Refining and Marketing Business - Conference Call, August 13, 2012, http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0CDEQFjAC&url=http%3A%2F%2Fphx.corporate-ir.net%2FExternal.File%3Fitem%3DUGFyZW50SUQ9NDc4MzEzfENoaWxkSUQ9NTExNDM1fFR5cGU9MQ%3D%3D%26t%3D1&ei=ocCPU4zaB4iOqAb_t4LQDA&usg=AFQjCNH0VQpjMISfBGmaQGNaHN0-GBPVsw&sig2=XfnG0PAyBnf1Wz_ud2tniA&bvm=bv.68235269,d.b2k

During 2014, we plan to continue to focus on our strategic priorities described above by:

- *delivering the improved California synergies, resulting from our acquisition and integration of the Southern California refining, marketing and logistics business; . . .*

Tesoro Logistics LP

TLLP was formed to own, operate, develop and acquire logistics assets to ***gather crude oil*** *and* ***distribute, transport and store*** *crude oil and refined products.* [Emphasis added throughout]

These plans, put forth so publicly, repeatedly, and recently, before and after the purchase of the BP properties, should have been disclosed in the ND as part of the Project. The ND is entirely at odds with this public description of Tesoro's own plans. Existing permit conditions listed in the ND are not sufficient to prevent these major refinery changes for which the storage tanks are needed.

The ND identifies the following existing permit conditions and makes very generalized conclusory statements that the Project is not for other purposes, but the ND does not provide the baseline evidence necessary to substantiate these claims, that are so in conflict with the evidence of Tesoro's own statements:

- The existing Tanks 80035 and 80036 are both currently permitted to store petroleum materials including crude oil, hydrocracking unit (HCU) feedstock (a light gas oil . . .
- The two new tanks are proposed to be permitted to store light and heavy crude oils of varying vapor pressures up to 11 pounds per square inch (psi), light gas oils such as HCU feedstock and fluid catalytic cracking unit (FCCU) feedstock, and heavy gas oil
- Tank 80038 is currently permitted to store petroleum distillate products with true vapor pressures less than 0.5 psi such as crude oil and heavy gas oils and is not connected to the vapor recovery system. Tank 80038 currently primarily stores vacuum gas oil, a heavy gas oil. The proposed modifications to Tank 80038 would change the type of commodity to be stored in the tank to also include light gas oil and connect Tank 80038 . . .
- All modifications associated with the proposed project will occur within the confines of the Wilmington Operations . . .
- . . . no modifications will occur at the Carson Operations.
- The proposed project was conceived, and the applications for the proposed project were submitted to the SCAQMD prior to Tesoro's acquisition of the Carson Operations.
- The overall amount of crude oil delivered to the Wilmington Operations will not change from current operations.
- The proposed project will not increase the total amount of crude oil delivered to the Wilmington Operations on an annual basis and will not alter the methods of

crude oil delivery because crude oil will continue to be delivered via ships and pipeline.

- No modifications are proposed to the existing crude oil delivery pipeline from the Marine Terminal. Further, no other pipelines that deliver crude or any other product to the Wilmington Operations will be modified as part of the proposed project.
- Further, Tesoro is not proposing to change the crude oil throughput of the Wilmington Operations or any downstream refining processes because crude oil storage capacity is not a limiting factor for the throughput and production at the Wilmington Operations.
- Refining operations fluctuate and are controlled by many factors, including but not limited to, equipment design parameters, market demand, equipment maintenance schedules, equipment permit limit conditions, and crude oil characteristics (e.g., sulfur content, acidity, specific gravity, etc.).
- . . Tesoro has operated the refining processes at the Wilmington Operations at the maximum capacity in the past and are expected to continue to operate up to or at maximum capacity in the future. Therefore, the baseline crude oil throughput rate and product output of the Wilmington Operations on a daily or an annual basis would not change as a result of implementing the proposed project.
- The refining capacity of the Wilmington Operations is constrained by a number of factors including equipment design parameters, market demand, equipment maintenance schedules, equipment permit limit conditions, and crude oil characteristics (e.g., sulfur content, acidity, specific gravity, etc.).
- The refining capacity is based on the overall design of the refining processes within the Wilmington Operations.
- The heat required to first separate crude oil into various intermediate products, which are later refined further, dictates the amount of crude oil that can be processed overall by the Wilmington Operations.
- Specifically, the Crude Unit, the first step in the refining process, receives the crude oil directly from storage (i.e., from both the existing and proposed storage tanks), has operating limits on the heater, which limits the amount of crude oil that can be processed.
- The Crude Unit operations fluctuate based on conditions of other process units within the Wilmington Operations, market demand, and crude oil characteristics.
- The Crude Unit heater routinely operates at various firing rates and will continue to operate at various firing rates, which is considered to be the baseline at the Wilmington Operations, and the proposed project does not include modifications to the Crude Unit throughput or heater firing rate.

The reasoning that no modifications will occur at the Carson refinery is conclusory, because the Project is currently self-defined as only including the pipe and storage tank increases.

The reasoning that operations "fluctuate" based on "conditions of other process units, market demand, and crude characteristics" is always true of every refinery. This general statement by no means precludes environmental impacts occurring.

No timeline or size of such fluctuations is identified in the ND, so they could be unlimited. Baseline periods and quantification of degree of fluctuations should be identified.

Such fluctuations in crude oil characteristics were identified in the literature previously cited as directly causing environmental impacts.

No baselines were provided for crude oil sulfur, metals, paraffin, or carbon content, or for any crude oil characteristics whatsoever.

Neither does the ND identify whether existing permit conditions for the tanks or other parts of the refinery include any limits on such characteristics.

The ND does not provide any information on the baseline "heat" provided in the crude unit heaters mentioned in the ND.

The ND does not provide any information about when in the past the refinery was operated at "maximum capacity," how maximum capacity is defined, how long ago this occurred, for how long this occurred, and at what percentage of the capacity the refinery is currently running.

Further, the ND does not identify the baseline levels of any other process units within the Wilmington refinery, or within the Carson refinery.

The ND does not identify whether there is existing piping connected to, or close to the Wilmington tanks that could bring materials in the future to the Carson refinery.

The ND does not identify whether the tankage increase in Wilmington could free up other tankage at either refinery, or that could be connected in the near future.

The ND does not identify whether such changes could change the yields of different units within the Carson or the Wilmington refinery.

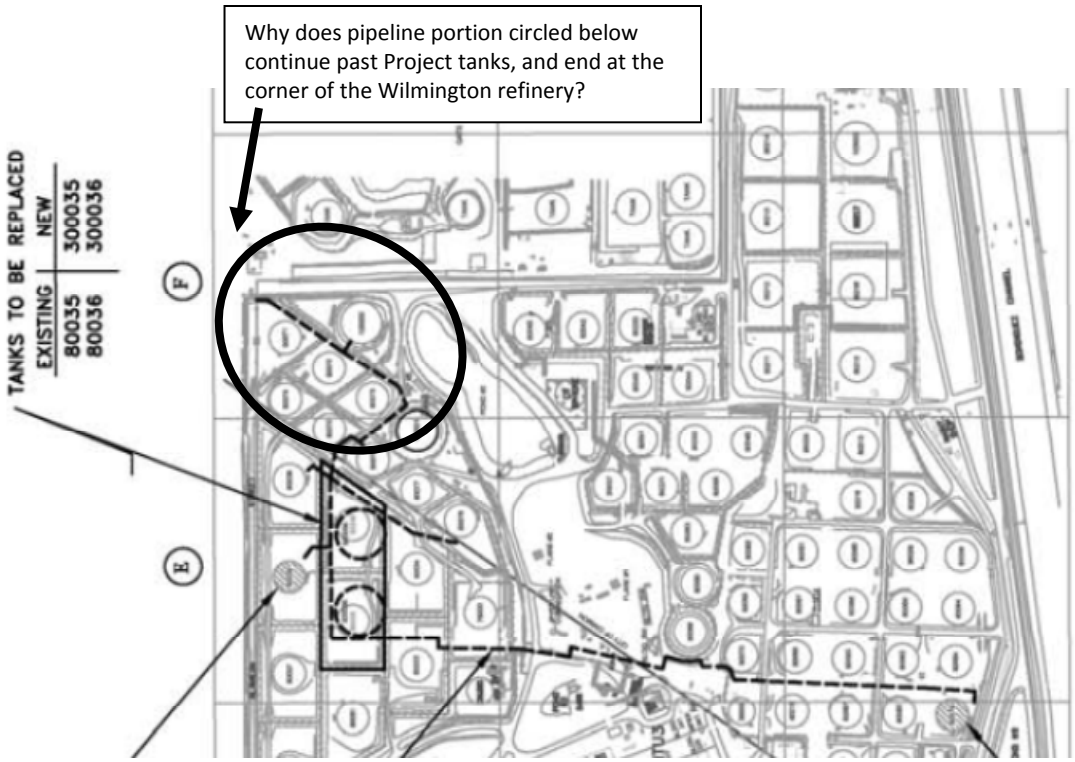
All these and more such details are essential to an evaluation of the Project and its impacts.

C. The new pipeline across the Wilmington refinery to the Project storage tanks continues *past* the tanks to the corner of the Wilmington property closer to the Carson property, and next to a railway

The ND states that the Project does not involve the Carson refinery, nor any transport by rail, or anything besides the pipeline and the storage tanks. But the new pipeline through the Tesoro facility is routed not only to the new tanks, but *beyond* them, to a corner of the refinery that is

close to the Carson portion of the refinery, and is also next to rail lines that traverse the length of the refinery between the Carson and the Wilmington operations.

I have circled the end of the pipeline route which was identified in the refinery layout map provided by the ND. The ND graphic shows an additional length of pipeline *beyond* the Project tanks, to the corner of the Wilmington refinery property, but provides no explanation about the potential for this extended pipeline to connect with additional refinery and logistics operations (including the Carson refinery, the adjacent rail yard, other storage tanks, and potentially even to trucking assets). There is also an extra leg of pipeline indicated without explanation, between two tanks that were not identified as part of the Project.



The ND must be recirculated as a full EIR, and the potential for connections to the Carson portion of the refinery must be identified. Existing nearby pipelines and connections, plans made known to the AQMD of such connections, and the general potential for such connections that the Project facilitates must be evaluated.

In addition to the potential that the storage tanks and pipeline are located in close proximity to the Carson refinery, they are also next to a rail line which runs from top to bottom to the left of the diagram above. The US Energy Information Administration website provides the following charts[31] showing the steady increase of alternative forms of crude oil delivery to oil refineries instead of ship (rail, barge, and truck), including in California. The ND states that Tesoro does not currently transport crude by rail to the Wilmington refinery (at 1-1), but that does not

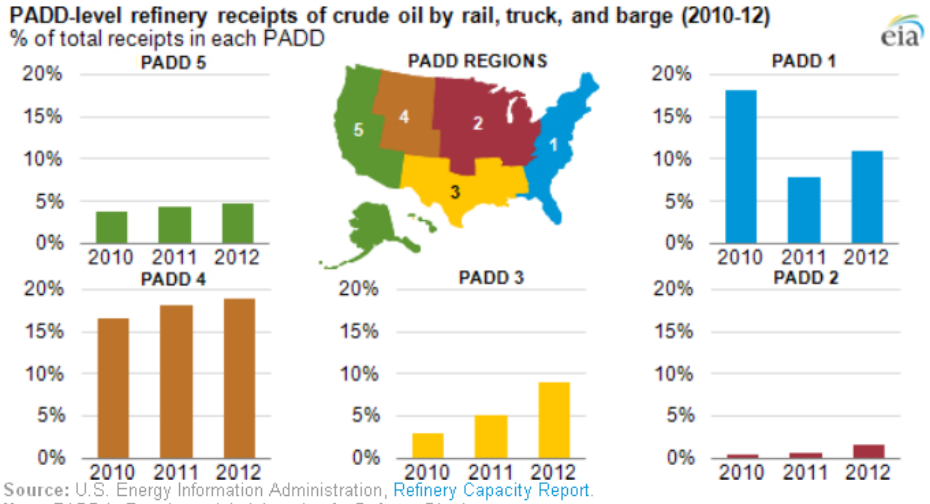
[31] http://www.eia.gov/todayinenergy/detail.cfm?id=12131

preclude the Project from facilitating such a project in the near future, especially given the proximity of the tanks to a rail line. The potential to connect in the future to other local rail should also have been discussed.

Further, Tesoro owns major truck terminal assets. The ND does not provide any information about any applications in process related to truck terminals, baseline activities, potential connections to other transport modes, or the potential for the increase in storage to be connected to Tesoro's terminal. While ship is the more obvious choice at this time, the potential for flexibility of these storage tanks for Tesoro to connect with other transport such as rail and truck should also have been evaluated in the ND.

JULY 17, 2013

Refinery receipts of crude oil by rail, truck, and barge continue to increase



Source: U.S. Energy Information Administration, Refinery Capacity Report.
Note: PADD is Petroleum Administration for Defense District.

The use of rail, truck, and barge to deliver crude oil to refineries has increased, in part due to increases in U.S. crude oil production. The increases, which vary by region, can be seen in EIA's recently released Refinery Capacity Report.

However, the most crucial omission was the failure to evaluate the Project's role in the integration of the Wilmington and Carson portions of the refinery complex.

D. Volumes and throughput are also publicly planned to increase at the Southern California Marine Terminals according to Tesoro

As described earlier, and also in Tesoro's May 1, 2014 earning call, Philip Anderson, President of Tesoro Logistics LP identified increases in the volumes that its terminals will handle (not just the speed of offloading), increasing throughput capacity[32]:

[32] Thomson Reuters Streetevents Edited Transcript, TLLP – Q1 2014 Tesoro Logistics LP Earnings Conference Call, May 1, 2014, pp .6-7.

"We have two of our terminals are being expanded to handle additional capacity, and those expansions will come online this summer. And that will allow us to bump up volumes either very late in the second quarter or early in the third quarter." . . .

"Our marine facility down there [Long Beach], 121, which is the large neighbor de-berth in Long Beach, stays pretty full. We have our legacy to Long Beach terminal [Marine Terminal] that is adjacent to our newly acquired, what we call, P-2 in Long Beach. And between P-2 and our legacy Long Beach terminal, we probably have an additional 100,000 plus barrels per day of throughput capacity."

The ND can't legitimately cut the baby in half – the reason for the increase in offloading through a much larger pipeline and into much larger tankage is admittedly a planned throughput increase in Tesoro's marine terminals.

Tesoro will be enabled to offload over 12 times as fast from its marine loading operations to the new and expanded onshore storage tanks through the Project's expanded 42-inch pipeline. Not only will this enable increased *speed* of offloading, it will free up the terminals to allow scheduling of additional ships to port for offloading at these large storage tanks.

As previously discussed, the US Department of Transportation found that all modes of transportation for Bakken crude need to assess the safety hazards it poses. Further, the AQMD must also evaluate the hazards involved with the transport by ship of heavy tar sands crude, and the diluents that come along with it.

E. The Project has the potential to increase coking

As identified above, there is a major potential to increase the proportion of heavy crude oil from Canada, which would increase coking. The AQMD performed source tests at South Coast refineries and found the following emissions (in lbs per coking cycle).[33] Coking cycles at least once a day. While the AQMD adopted a regulation to reduce these emissions, final deadlines of the regulation are in 2019, so increased coking in the meantime will mean increased impacts from VOCs, particulate matter, sulfur compounds, and the greenhouse gas methane from these operations, which were not evaluated in the EIR. First the ND needs to provide information about the crude slate baseline and coking baseline so that the degree of increased coking can be identified.

[33] Proposed Rule 1114 Working Group Meeting, September 27, 2012, Petroleum Refinery Coking Operations (staff presentation, Slide 4)

AQMD Source Test Results

Company	Test Initial Drum Vent Pressure (psig)	-- lbs/cycle --				
		VOC	PM	Condensable PM/VOC	Sulfur Compounds	Methane
BP	0.89	4.44	3.77	0.66	8.18	165.47
Chevron	0.4	11.16	1.25	12.50	N/A	66.96
Conoco[1]	N/A	N/A	N/A	N/A	N/A	N/A
ExxonMobil[2]	11	1.38	0.34	0.54	N/A	12.72
Tesoro	7	5.3	0.36	1.46	N/A	34
Valero	3.9	4.28	0.26	0.46	0.45	1.86

1. Vent time very short, no sample was obtained
2. Results inconclusive, test was cut short due to safety concerns

F. The increased Storage Tanks themselves have significant impacts, for example, due to the increased tank and pipeline size causing increased risk from fires and earthquakes

The Project treated earthquakes and fires as separate issues. This provides an unrealistic probability that oil and gas fires would occur. The Project instead should be considered to cause a significant increase in the probability of oil and gas fires due to the imminent earthquake hazard. Oil and gas fires are very difficult to extinguish, and could easily spread. Such fires can emit large clouds of hazardous black smoke over the region.

Obviously, the risk of explosion and fire due to Bakken crude oil represents much increased risk, as previously discussed. However, just the increased size of the tankage increases the volume of material vastly, which of course increases the impacts when a fire or explosion occurs, regardless of the type of crude oil present.

A major earthquake is not just a theoretical possibility. The risk of a major earthquake in the region is imminent and severe. A September 2005 Los Angeles Times article,[34] *Katrina's Aftermath, California Earthquake Could Be the Next Katrina,* reported:

> "A state study published last year on hazard reduction paints a sobering picture of California's earthquake danger. About 62% of the population lives in a zone of high earthquake danger, including 100% of the population of Ventura County, **99% of Los Angeles County** and 92% of Riverside County. . . .
>
> **"Researchers at the Southern California Earthquake Center said there is an 80% to 90% chance that a temblor of 7.0 or greater magnitude will strike Southern California before 2024**."

[34] September 10, 2005, Los Angeles Times, KATRINA'S AFTERMATH, California Earthquake Could Be the Next Katrina, by Jia-Rui Chong and Hector Becerra, Times Staff Writers, http://www.latimes.com/news/local/la-earthquake08sep08,1,2126004.story?coll=la-util-news-local

The Southern California Earthquake Center (at the University of Southern California)[35] (SCEC) earlier found:[36]

> *"The last official estimate of earthquake potential in southern California was the 1988 report of the Working Group on California Earthquake Probabilities. The report estimated the probabilities of large "characteristic" earthquakes on major faults, like the San Andreas and San Jacinto faults. The report concluded that there is a 60% chance of at least one large earthquake (M=>7) on the San Andreas fault before the year 2018.*

The report concluded that the probability is even higher, 80-90%, when other faults are included." Such an earthquake could occur today. Severe ground shaking will occur during the inevitable major earthquake in Los Angeles area. Los Angeles' soil types cause increased ground shaking:[37]

The Uniform Building Code does not prevent significant and even severe earthquake damage In an Environmental Impact Report performed for Industrial Service Oil Company, Inc. (ISOCI) of Los Angeles, the potential for damage to structures (including oil treatment and storage structures) was identified, despite the fact that the facility stated it would comply with the Uniform Building Code:[38]

> ***Based on the historical record, it is highly probable that the Los Angeles region will be affected by future earthquakes.*** *Research shows that damaging earthquakes will be likely to occur on or near recognized faults showing evidence of recent geologic activity.*
>
> *The impacts of an earthquake on the site are considered to be greater than the current conditions since additional structures will be constructed including new treatment and storage facilities.* ***Impacts of an earthquake could include tank and other structural failure.***
>
> *Additional structures at the site must be designed to comply with the Uniform Building Code . . . The goal of the code is to provide structures that will:*
>
> *(1) Resist minor earthquakes without damage;*
>
> *(2) resist moderate earthquakes without structural but with some non-structural damage; and*

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[35] SCEC (at the University of Southern California) gathers and combines new information about earthquakes in Southern California, is supported by the National Science Foundation and the U.S. Geological Survey, and coordinates efforts of over 50 institutions

[36] *Seismic Hazards in Southern California: Probable Earthquakes, 1994-2024,* Presentation and Panel Discussion Held at the OES Conference, "Northridge Earthquake--One Year Later," January 20, 1995, Southern California Earthquake Center, http://www.scec.org/news/newsletter/issue11.pdf

[37] *"Another project in progress will update this map by showing a higher level of shaking for soft-soil sites. This will lead to a higher rate of damaging shaking because the more common smaller earthquakes will produce greater shaking in soft soil. The result will be to increase slightly the rates for the sedimentary basins such as the Los Angeles basin and the San Gabriel, Ventura and San Bernardino Valleys."* Seismic Hazards Map for Southern California, Southern California Earthquake Data Center, http://www.data.scec.org/general/PhaseII.html

[38] Draft Environmental Impact Report for the Industrial Services Oil Company, Inc. (ISOCI) Hazardous Waste Facility Application, November 2005, page 3-58

> *(3) resist major earthquakes without collapse but with some structural and non-structural damage. . . .*

Thus, the ISOCI EIR found that an earthquake in the region could cause tank and other structural failure, and also found that the Uniform Building code does not preclude all damage from earthquakes. It found that the Code is only meant to cause *resistance* to earthquake damage and collapse. These same risks exist at the proposed Oxy site.

A discussion of remaining risks which exist after compliance with the Uniform Building Code was provided in a publication by Dr. Robert J. Kuntz, President of the California Engineering Foundation, and Daniel L. Tanner, the California Engineering Foundation's Economic Consultant. This document found:[39]

> **The California Building Code offers only minimal protection from seismic damage,** i.e., a structure should not be damaged in a minor earthquake, damaged beyond repair in a moderate earthquake, nor collapse in a major earthquake. However new technologies, such as seismic isolation, can mitigate both structural and building contents damage and are becoming available to government and industry. There is a need for design professionals, building officials, planners, and building owners to become aware of these new technologies, the criteria for their use, and how to incorporate them into practice.
>
> **The Uniform Building Code provides minimal seismic protection determined acceptable by local governments, but Code specifications do not prevent structural damage nor ensure the use of a building after an earthquake.**
>
> Such limited protection is not consistent with the needs of commerce or emergency facilities, which must remain operational after an earthquake, nor does it protect the contents of a building. Two earthquakes which struck near the Lawrence Livermore National Laboratory in California, within two days of each other in January of 1980, caused a total of $10 million in damage. Nearly half of the damage was to laboratory equipment, testing systems, and other building contents.

As an illustration of the potential damage that can occur in an industrial area during a major earthquake, the 1999 earthquake in Turkey was evaluated by the Pacific Earthquake Engineering Research Center. An excerpt of a report on this study is provided below. The report found *"The earthquake struck the industrial heartland of Turkey."* It found that complete structural failures due to earthquake were few in number, but severe damage short of complete structural failure did occur. One example was the failure of floating roofs in crude oil tanks.

Such fracturing and crumpling of support structures and other earthquake damage to industrial equipment not only cause leaks and spills, but could easily cause fires. Even in residences, fires during earthquakes are a known common hazard due to leaking natural gas, broken structures and electrical systems, ignition sources, etc. When damage occurs during major earthquakes to heavy industrial facilities that store, transfer, and process combustible materials, there is even more potential for dangerous fires. The Turkish example included a fire during the 1999

[39] Disaster Recovery Journal, 1999, http://www.drj.com/drworld/content/w2_066.htm

earthquake when a refinery cooling tower failed, and also when eight naphtha- storing fuel tanks burned.

A publication funded by the Earthquake Engineering Research Institute and the Washington Emergency Management Division (2005)[40] found severe damage due to earthquakes, including long term environmental impacts of hazardous material releases. The Report found:

> Fire following the earthquake caused severe damage to the Tüpras refinery. Other observed structural failures in the refinery were to a 115-m-tall smokestack, floating roofs in crude oil tanks, and piles supporting a jetty. Substations and one power generation facility suffered damage ranging from overturned transformers to fractured porcelain switches."

Another publication described the Kocaeli fire, the tank structural damage, fire and collapse, and oil spilled into the sea, and major equipment including a large boiler knocked off its foundation:[41]

Fig. 5. Fire damage to naphtha tanks at Tüpras refinery.



In addition to the risk of fires associated with earthquakes well known to California regulators (as well as those documented after the Turkish earthquake), a publication of the University of Patras, Greece -- *Safeguarding Hydrocarbons Inside Local Earthquake Defense Systems*[42] --

[40] *Scenario for a Magnitude 6.7 Earthquake on the Seattle Fault, A Project Funded by the Earthquake Engineering Research Institute and the Washington Emergency Management Division, February 2005, Excerpts from a publication of the same title to be released March 2005* , page 20, http://seattlescenario.eeri.org/documents/EQ%202-28%20Booklet.pdf

[41] *PEER Center News*, Vol. 2 No. 4 October 1999, http://peer.berkeley.edu/news/1999october/turkey.html , excerpt. *PEER Center News* is a quarterly publication of Pacific Earthquake Engineering Research Center, highlighting research and information of interest to earthquake engineering researchers and professionals. http://peer.berkeley.edu/news/1999october/turkey.html

[42] *Safeguarding Hydrocarbons Inside Local Earthquake Defense Systems,* Project participants: UPS: Seismology Centre, University of Patras, Greece, UEA: School of Environmental Sciences, University of East Anglia, Norwich, England, DEPA: The Public Gas Company of Greece, GSCP: The General Secretariat of Civil Protection, AGISCO, Aspinal & Associates, and ECS: Euroconsultants,

found major fire risks from earthquakes associated with burning hydrocarbons to be a general problem around the world:

> ***"Hydrocarbons, particularly gas, also create a much increased risk of fire as a major secondary consequence following earthquake damage.*** *There is a growing danger that major Greek cities may experience fire damage after a strong earthquake, enhanced by the increased supply of gas into urban areas. Fires following the earthquake at Kobe in Japan 1995 and Turkey 1999 (Fig.1,2) provided a salutary example of impact even in a well-regulated, modern and earthquake conscious country. Longer memories recall the conflagration in Tokyo that followed the 1923 Kwanto earthquake."*

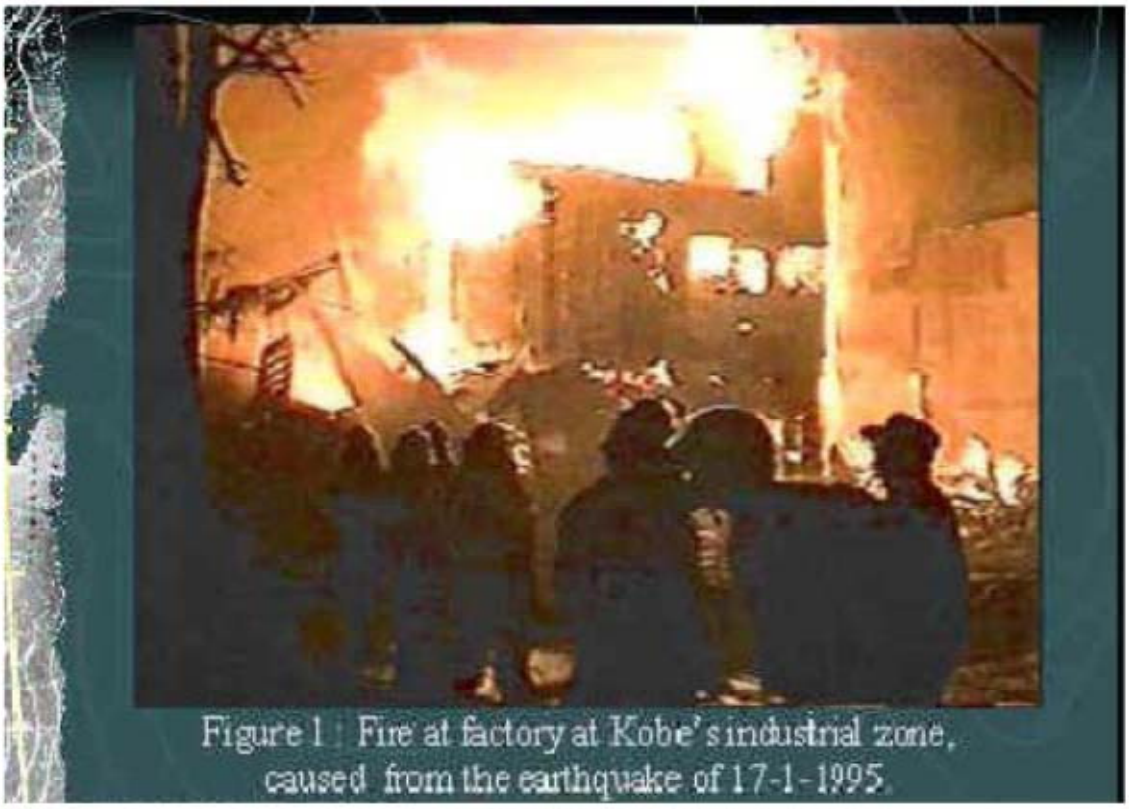


Figure 1 : Fire at factory at Kobe's industrial zone, caused from the earthquake of 17-1-1995.

The new tanks could be used for Bakken or Canadian Tar Sands crude oil according to Tesoro's plans. Bakken crude oil has been shown to be explosive (as in the tragic Lac Megantic rail explosion). It is indisputable that fires and explosions, especially due to earthquake must be evaluated in a new ND related to Tesoro's and Tesoro Logistic's plans to bring Bakken crude oil into its facilities and crude oil tanks.

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http://seismo.geology.upatras.gr/shields/SHIELDS2003.htm

But even with heavy Canadian Tar Sands crude that Tesoro may switch to, an earthquake or other impact could cause a major oil fire. (And that is without considered the addition of volatile diluents added to tar sands crude, which should have been considered.)

An example of severe fires at a facility processing heavier grades of oil includes the Third Coast Industries fire in Houston Texas. The U.S. Chemical Safety and Hazard Investigation Board came to the conclusion that higher flash point ("non-ignitable") materials such as heavy oils can represent major fire hazards.[43] This agency concluded after evaluation of the huge 2002 automotive fluid blending plant fire in Texas, that oils with flash points greater than 200°F classified as "Combustible IIIB" (including motor oils) should be treated with more care regarding fire safety. The Texas fire under investigation could not be put out, and completely destroyed the facility.

In the Texas case, the Chemical Safety Board found that while most of the material onsite at this facility had higher flash points (meaning they wre heavier, less volatile materials), the presence of small amounts of some liquids which were more easily combustible with lower flashpoints, could have caused the fire to start, and then combusted the bulk of the higher flashpoint materials. The Chemical Safety Board found that such higher flash point oils burn "fiercely" once a fire is started.

The Board concluded that fire codes and workplace safety regulations should apply more controls to combustible liquid storage and handling. In the aftermath of the Third Coast fire, the Board communicated its concerns in correspondence to the U.S. Occupational Safety and Health Administration (OSHA). The Chemical Safety Board also found:

> . . . the facility was not designed to contain the contaminated runoff that could result from fighting the fire with water. Fire officials therefore decided they had no choice but to let the plant burn, and they focused on protecting nearby homes from destruction.

A 2005 oil depot fire in the Hertfordshire in the United Kingdom also illustrates how severe offsite impacts from smoky oil fires can be. The inefficient burning of petroleum products at this site caused huge smoking plumes similar to smoking which could occur at the Warren facility if a fire were to break out, due to earthquake or other reasons.[44]

The Hertfordshire Oil Terminal fire showed that such fires cause huge smoky plumes due to poor combustion of hydrocarbon materials. Smoke from an oil fire and/or hazardous materials burning could cause major emissions of particulate matter, PAHs (Polycyclic Aromatic Hydrocarbons), sulfur oxides, heavy metals including lead, mercury, and chromium, chlorinated compounds including deadly dioxins, and many other hazardous compounds.

Smoky fires and gas plumes from such an event could reach nearby residential areas and impact workers offsite and onsite, and could billow for miles. Even a moderate fire could heavily impact

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[43] *Third Coast Industries Fire,* Brazoria County, Texas May 1, 2002, U.S. Chemical Safety and Hazard Investigation Board, CSB Investigation Digest, http://www.csb.gov/third-coast-industries-petroleum-products-facility-fire/

[44] http://en.wikipedia.org/wiki/2005_Hertfordshire_Oil_Storage_Terminal_fire#Causes

neighbors and schoolchildren, especially people with respiratory problems, asthma, or heart conditions, but could also significantly impact healthy adults. The impact would depend on fire size, availability of the fire department (which may not be the case in an earthquake), and how long it takes to put out the fire. In the event of an earthquake, the public has been repeatedly informed that emergency services may not be available for some time, due to obstructions on roadways, and broken water supplies.

The potential of such hazards due to a major earthquake must be evaluated in an EIR.

G. The approximate mile-long expanded pipeline from the Marine Terminal to the Wilmington refinery tanks increases earthquake risks

The ND fails to evaluate the increased volume of crude oil present in the pipeline at any one time, and the increased risk of spill this would cause, especially due to earthquakes. It relies on a stated assumption that annual transport would stay the same (which is also contradicted by Tesoro's published plans, and not inherently true unless specific new conditions are set).

See the discussion above about risks of fires and explosions related to Bakken and Canadian Tar Sands Crude oil in the new expanded storage tanks. The same concern applies due to the large amount of petroleum material that would be added to the approximately mile-long pipeline from the marine terminal to the tanks. Compliance with building codes is meant to reduce risks, but is not considered to eliminate earthquake risk. The ND was wrong in its failure to consider the combination of fire and explosion from earthquakes, which would obviously be increased due to the higher volumes of materials that would be present. The smoky black plumes caused by oil fires contain particulate matter, PAHs (Polycyclic Aromatic Hydrocarbons) and many other harmful compounds that should have been evaluated in the ND with regards to oil fire risk that will certainly be significantly elevated due to the Project increases.

H. Other Potential Project Impacts

Evaluation of the following should be added, especially given the changes in crude slate planned by Tesoro:

- Tank cleaning and degassing: Storage tanks must be periodically cleaned. Emissions from tank cleaning operations for preparation for the modifications of the existing tanks, and later tank cleaning during ongoing operation of both existing and new tanks, was not identified and assessed. Because refinery crude oil storage tanks are very large, and over time crude storage results in accumulation of heavy sludge (called tank "bottoms"), this must periodically be cleaned and removed. SCAQMD Rule 1149 (Storage Tank and Pipeline Cleaning and Degassing) controls but does not eliminate these emissions from the extremely large volumes of hydrocarbon product in these tanks.[45] Tank cleaning and degassing protocols and frequency should be identified and emissions calculated.

[45] Final Environmental Assessment: Proposed Amended Rule 1149 – Storage Tank and Pipeline Cleaning and Degassing, April 2008, SCAQMD http://www.aqmd.gov/ceqa/documents/2008/aqmd/finalEA/FEA1149.pdf

In addition, the Hydrocarbon Processing article (Innovative Solutions) identified storage tank waxy buildup and sludge as a specific problem with shale oil storage, with a solution to use chemicals to break up the waxes. The impacts, effects on tank operation and cleaning, and impacts of solutions such as chemicals used to break up waxes, should also be evaluated in an EIR process.[46] Furthermore, impacts related to tar sands storage and tank cleaning, including heavy tank bottoms, and use of diluents must be addressed.

- Pipeline cleaning and degassing: Pipelines are also periodically cleaned and degassed, and in this case, emissions would likely occur not only during future pipeline operation and maintenance activities, but also during the construction connection process with the new tanks. Again, Rule 1149 applies, but does not eliminate all emissions. Further, shorter runs of pipe are exempt, as described in the SCAQMD staff report, and so would not be controlled.[47] Identification of the pipeline lengths, connectors, construction activities, operation, and maintenance activities, including cleaning and degassing, and fugitive emissions from connectors should be specifically described and emissions quantified.
- Flaring of tank and pipeline gases: If flares are used to control degassing emissions for tanks and pipelines, the gas volumes, flare hydrocarbon destruction efficiency, and remaining VOC emissions from flaring should be identified (as well as NOx, SOx, particulate matter, and other emissions).
- Unplanned process shutdowns: Because unconventional crude oils can reduce run-time to half that of planned turnarounds (planned maintenance schedules) as identified in the earlier-cited Oil & Gas Journal article, this means additional air emissions. Unplanned refinery shutdowns increases startup / shutdown and maintenance emissions include increased flaring emissions, potential pressure relief device venting to atmosphere, and also increase the risk of fires and explosions with many associated emissions (not only VOCs, but particulate matter, hydrogen sulfide, all the criteria pollutants, toxics including PAHs (polycyclic aromatic hydrocarbons), and many more). They also increase safety risks for workers and neighbors)

[46] *"Due to the variation in solids loading and their paraffinic nature, processing shale oils in refinery operations offers several challenges. Problems can be found from the tank farm to the desalter, preheat exchangers and furnace, and increased corrosion in the CDU. In the refinery tank farm, entrained solids can agglomerate and rapidly settle, adding to the sludge layer in the tank bottoms. Waxes crystalize and settle or coat the tank walls, thus reducing storage capacity. Waxes will stabilize emulsions and suspend solids in the storage tanks, leading to slugs of sludge entering the CDU. Waxes will also coat the transfer piping, resulting in increased pressure drop and hydraulic restrictions."*

[47] At p. 1-13

IV. Conclusion – Potential Impacts are large, have not been mitigated, no alternatives or Cumulative Impacts were analyzed, and an EIR must be developed

My conclusion is that there is an abundance of evidence on the deficiencies in the Project Description and the missing significant environmental impacts due to the full actual Project. Accordingly, AQMD is required to prepare a full EIR. Because the ND incorrectly portrayed this Project as relatively a minor change, numerous impacts are either understated or missing. Mitigation, Cumulative Impacts and Project Alternatives to avoid these significant impacts were not evaluated.

CBE et al. Comments on the Recirculated Draft Environmental Impact Report for the Phillips 66 Propane Recovery Project.

ATTACHMENT A:

Expert Report of Greg Karras on the Recirculated Draft Environmental Impact Report for the Phillips 66 Propane Recovery Project, 12/5/14

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Expert Report of Greg Karras
Communities for a Better Environment (CBE)
5 December 2014

Regarding the

Phillips 66 Company Propane Recovery Project
Recirculated Draft Environmental Impact Report (RDEIR)
Released in October 2014 by the Contra Costa County
Department of Conservation and Development
State Clearinghouse #2012072046
County File #LP12-2073

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I, Greg Karras, declare and say:

1. I reside in unincorporated Marin County and am employed as a Senior Scientist for Communities for a Better Environment (CBE). My duties for CBE include technical research, analysis, and review of information regarding industrial health and safety investigation, pollution prevention engineering, pollutant releases into the environment, and potential effects of environmental pollutant accumulation and exposure.

Qualifications

2. My qualifications for this opinion include extensive experience, knowledge, and expertise gained from nearly 30 years of industrial and environmental health and safety investigation in the energy manufacturing sector, including petroleum refining, and in particular, refineries in the San Francisco Bay Area.

3. Among other assignments, I served as an expert for CBE and other non-profit groups in efforts to prevent pollution from refineries, to assess environmental health and safety impacts at refineries, to investigate alternatives to fossil fuel energy, and to improve environmental monitoring of dioxins and mercury. I served as an expert for

CBE in collaboration with the City and County of San Francisco and local groups in efforts to replace electric power plant technology with reliable, least-impact alternatives. I served as an expert for CBE and other groups participating in environmental impact reviews of related refinery projects, including, among others, the Chevron Richmond refinery "Modernization Project" now subject to review pursuant to a California Court of Appeals Order,[1] and the Phillips 66 "Rail Spur Extension and Crude Unloading Project" now before San Luis Obispo County.[2] I serve as an expert for CBE in collaboration with community, labor, and other groups in a project involving investigation of environmental health and safety impacts of, and alternatives to, refining lower quality crude oils.

4. I authored a technical paper on the first publicly verified pollution prevention audit of a California petroleum refinery in 1989 and the first comprehensive analysis of refinery selenium discharge trends in 1994. I authored an alternative energy blueprint, published in 2001, that served as a basis for the Electricity Resource Plan adopted by the City and County of San Francisco in 2002. From 1992–1994 I authored a series of technical analyses and reports that supported the successful achievement of cost-effective pollution prevention measures at 110 industrial facilities in Santa Clara County. I authored the first comprehensive, peer-reviewed dioxin pollution prevention inventory for the San Francisco Bay, which was published by the American Chemical Society and Oxford University Press in 2001. In 2005 and 2007 I co-authored two technical reports that documented air quality impacts from flaring by San Francisco Bay Area refineries, and identified feasible measures to prevent these impacts.

5. My recent publications include the first peer reviewed estimate of combustion emissions from refining denser, more contaminated 'lower quality' oil based on data from U.S. refineries in actual operation, which was published by the American Chemical Society in the journal *Environmental Science & Technology* in 2010, and a follow up study that extended this work with a focus on California and Bay Area refineries, which was peer reviewed and published by the Union of Concerned Scientists in 2011. I also presented invited testimony on *inherently safer systems* requirements for existing refineries that change crude feedstock at the U.S. Chemical Safety Board's public hearing on the Chevron Richmond refinery fire that was held on 19 April 2013. My CV and list of publications were submitted with my September 2013 report in this matter.

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[1] *See CBE v. City of Richmond* 184 Cal_App.4th.

[2] *See* also Contra Costa Pipeline Project file, County File #LP072009, SCH #2007062007.

Scope of Review

6. In my role at CBE I have reviewed the Phillips 66 Company 'Propane Recovery Project' Recirculated Draft Environmental Impact Report (RDEIR), 'Rail Spur Extension and Crude Unloading Project' Revised Draft Environmental Impact Report (Rail Spur RDEIR),[3] 'Throughput Increase Project' Final EIR (Throughput Increase FEIR),[4] and the projects or project components discussed in those documents. I commented previously in this matter and reassert my previous comments[5] as they remain valid and have not been addressed in the RDEIR. My review of the project and RDEIR reported herein is focused on the adequacy of the project description and analysis in the RDEIR for evaluating potential environmental impacts of the project. My opinions on these matters and the basis for these opinions are stated in this report.

Changes to the Project

7. The RDEIR describes the project differently from the DEIR in several ways that are identifiable from detailed review but are not discussed in the RDEIR as changes in the project description or changes in the project. These changes involve the *amounts* of propane and butane (LPG) to be recovered, the *sources* of that LPG, the *streams* to be hydrotreated, and the *scope* of cooling system changes. Each is discussed in turn below.

8. Amounts of propane and butane that the project could recover were described as 4,200 barrels per day (b/d) of propane and an additional 3,800 b/d of butane in the DEIR. In contrast, the RDEIR asserts *both* a draft air permit limit on the lump sum of propane and butane to be recovered (14,500 b/d LPG; RDEIR at 3-31, 3-33) *and* a project design basis of 5,580 b/d propane and 4,996 b/d additional butane (15,474 b/d LPG including the butane that is already recovered; RDEIR at 3-33, 3-34). No irrevocable commitment to retain the proposed 14,500 b/d permit limit throughout the 30–50 year expected operation of the project is asserted or documented. The RDEIR does not note that the design basis is thus relevant to potential impacts, or explain this change to the project in its text.

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[3] 'Rail Spur' proposal; SCH #2013071028; now pending before San Luis Obispo County.
[4] 'Throughput Increase' proposal; SCH #20081010111; now pending final project approval.
[5] My 4 Sep 2013 report regarding this matter (Karras Rodeo Report-1), 7 Jan 2014 Supplemental Evidence–B, 14 Jan 2014 Supp. Evidence–C, 20 Jan 2014 Supp. Evidence–D (co-authored with Roger Lin), and 24 Nov 2014 report regarding the 'Rail Spur Extension and Crude Unloading Project' (Karras Rail Spur Report) are appended hereto as attachments 1, 2, 3, 4, and 5, respectively. Exhibit 1 of my Rail Spur report is appended hereto as Karras Exhibit 1.

9. Sources of the LPG to be recovered, as described in the DEIR, did *not* include several streams feeding 'RFG-A.' (DEIR Figure 3-6.) These 'RFG-A' streams are now included among those from which LPG could be recovered. (RDEIR Figure 3-6.) This change in the project description reveals undisclosed changes in hydrogen plant feed and further implicates feedstock from the Santa Maria facility (see figs. 3-4, 3-6), but the RDEIR includes no discussion of any potential effects from this change in the project.

10. Additional hydrocarbon streams would be treated by the proposed new hydrotreater, but this change and its implications are not discussed in the RDEIR. Naphtha streams from the heavy gas oil hydrocracker (Unit 246) and the ULSD diesel hydrotreater (U250) are fed to reforming units U231 and U244 now, but the revised project description would instead route them through the new hydrotreater. (Compare DEIR and RDEIR figures 3-4, 3-5, and 3-6.)

11. The project would modify the Rodeo facility's antiquated once-through cooling (OTC) system and those modifications would include, among other things, new heat exchangers. However, cooling system changes described in the DEIR were limited to cooling the proposed new propane *recovery* (DEIR at 3-27) while the RDEIR appears to expand this description to cover all cooling "demands for the proposed Project." (RDEIR at 3-37.) The RDEIR's text does not mention or explain this change in the project description. This omission further compounds its lack of disclosure regarding the process sources and amount of the additional heat to be transferred to the San Francisco Bay.

Feedstock Change

12. Changes in the type, quantity, and quality (e.g., density, distillation properties, LPG content, hydrogen content, sulfur content, metals content, organic acids content) of crude oil processed are not disclosed in the RDEIR. Crude oil is the basic feedstock of oil refining. This nondisclosure is a fundamental flaw in the RDEIR.

13. The RDEIR asserts that the project would not have "any effect on the types and/or quantities of crude oil feedstocks that can be processed," does not "propose to add, change, or modify the operation of other process units, such as the coker" (RDEIR at 3-28), and "has no connection to the transportation of crude oil by rail" (RDEIR at 3-7). These assertions are unsupported, misleading, and incorrect. Crude is the feedstock for

this LPG production. Feedstock and products are key process variables that are fundamentally interrelated. Phillips 66 and other California refiners are switching to different crude feedstock sources at present. Crude from different sources can yield different amounts of propane and butane in refinery distillation processes, and in refinery cracking processes such as coking and hydrocracking. These connections between refinery crude feeds, processing, and LPG production are beyond reasonable dispute. Moreover, Phillips 66 does, in fact, propose to change (increase) coking and other processing of new types of crude brought in by rail.

14. Phillips 66 proposes to increase coking and other processing rates via its 'Throughput Increase Project, which would increase its Santa Maria Facility (SMF) crude processing rate.[6] Because the SMF cannot make gasoline, diesel or jet fuel and sends all the semi-refined crude liquids it produces to Rodeo for further processing, that would necessarily increase the volume of oil from the SMF that would be processed at Rodeo.[7] Some of this increasing oil volume from the SMF would be processed by the Rodeo coking unit U200, its hydrocracking units U240 and U246, and its diesel hydrotreater U250 (after U240 'Prefrac' distillation; see 'SMGO,' RDEIR Figure 3-4). The RDEIR fails to disclose this proposed change in the operation of the coker and other refinery process units to process larger amounts of crude delivered through the SMF.

15. As stated, crude feedstock yields LPG from distillation (e.g., 'prefractionation') and also from cracking (e.g., coking and hydrocracking). Thus, SMF crude inputs are connected to the Rodeo LPG recovery proposal through distillation and cracking of the semi-refined oils sent from the SMF to Rodeo to finish the processing needed to make gasoline, diesel and jet fuel from crude. Phillips 66 currently proposes to receive this crude feedstock at the SMF by rail.[8] Therefore, its assertion that the project "has no connection to the transportation of crude oil by rail" is a clear error in the RDEIR.

16. The publicly verifiable data in the record indicate that insufficient propane and butane is recoverable in the project baseline to implement the project without additional cracking process feedstock, additional LPG-rich feedstock, or both. My past comments and those of others raised and documented this finding.[9] Estimates based on publicly

[6] *See* Throughput Increase FEIR; *see* also Rail Spur RDEIR at 2-35 (pending final approval).
[7] *See* Karras Rail Spur Report at paragraphs 15–28.
[8] *See* Rail Spur RDEIR; currently in CEQA review before San Luis Obispo County.
[9] *See* attachments 1, 3, 4; reports and comments of P. Fox on the LPG and Rail Spur projects.

verifiable, plant-specific data for LPG recoverable with available technology indicate that roughly half Phillips' proposed LPG recovery capacity would be idled in these 'baseline' conditions.[10] Unfortunately, instead of reporting and analyzing publicly verifiable data on current and potential sources of recoverable LPG, the RDEIR dismisses this evidence with unsupported and contradictory assertions. The RDEIR's revised estimate now tacitly admits a small baseline LPG shortfall below project design capacity, ranging from 10–31% of this capacity being idled, depending upon the averaging period chosen.[11] However, the RDEIR estimate is not supported by publicly verifiable data, overestimates the baseline by applying maximum conditions as average ones for at least some streams, and further inflates the baseline by including LPG streams that are not feasible to recover in its 'recoverable' estimate.[12] Compounding its errors, the RDEIR omits industry-wide data revealing that its estimate appears improbably high.[13] Thus, rather than any 'battle of experts' problem, the RDEIR simply ignores all the data refuting its conclusion on this key point while including no supporting data, but its analysis appears misleading in another way as well. Instead of a typical 'baseline' period before the project notice, it asserts an LPG estimate for 2013 (RDEIR at 3-35), a year when the refinery had already begun to boost crude feedstock volume, and did so at least in part on new tar sands oil feedstock[14]—the very same change it insists has nothing to do with the project.

17. The RDEIR's new assertion that "no new butane or propane can be added to the semi-refined products sent from the" SMF because of "vapor pressure limits" on storage tanks along the company's proprietary pipeline from the SMF to Rodeo[15] is unsupported, erroneous, and misleading. This assertion is not supported by even a shred of data in the RDEIR—and it is improbable, as the naphtha (pressure distillate) and gas oils produced and sent by the SMF would be expected to have vapor pressures well below the limits cited. Data the RDEIR *should* have included but did not show this assertion is wrong.

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[10] *See* attachments 1, 3, 4; reports and comments of P. Fox on the LPG and Rail Spur projects.
[11] RDEIR at 3-33 through 3-35, reporting unsupported total LPG averages of ≈10,600 b/d (month of Dec 2013) and 13,970 b/d (2013-annual) vs. a project design basis of 15,474 b/d.
[12] *See* attachments 1, 3, 4; and the reports and comments of P. Fox, *esp.* on Refinery Manager Evans' 6 Jan 2014 *Response to Appeals.* Note also that 'RFG-A' streams the RDEIR estimate includes were *not* fed to LPG recovery before the project description changed (*see* paragraph 9).
[13] *See* Att. 3 at 1 (*maximum monthly* West Coast yield less than half claimed Rodeo *annual* yield).
[14] *See* Rail Spur RDEIR at 2-35 (compare 2010–2012 vs. 2013 SMF crude throughputs) and 2-31 (SMF crude feed has been up to 7% bitumen-derived 'dilbit' crude "for about one year").
[15] RDEIR at 3-25, 3-26; *see* also Phillips SFR Manager's 1/6/14 'Response to Appeals.'

(See Fox SMF Rpt–2.)[16] The tanks are controlled and thus exempt from the claimed vapor limits, their measured vapor pressures are far below the claimed limits, or both. (Id.) This assertion also ignores—and distracts attention away from—the LPG feedstock sent to Rodeo not as LPG, but as gas oils and pressure distillate/naphtha that yield significant amounts of LPG during processing at Rodeo.

18. Ultimately, the RDEIR's assertion that the project "would not require the Refinery to change the basic feedstocks that are currently received and processed" because it "does not propose to increase the production of propane or butane"[17] is unsupported and inaccurate because it ignores ongoing changes in crude feedstock. This existing condition is a known impetus for projects at the refinery that has been acknowledged by San Luis Obispo County[18] and by Phillips 66 itself.[19] As shown below, the refinery will need to replace its current crude feedstock in order to produce sufficient propane and butane to implement the project over its expected operational duration.

19. Currently changing crude feedstock, driven by declining San Joaquin Valley Pipeline (SJVP) crude inputs to the Rodeo Facility, has been established—and accepted by Phillips 66 and public agencies alike—as a driving factor in Phillips' Marine Terminal Offload Revision Project. (BAAQMD, 2012; CSLC, 1995.)[20] That increase in crude and gas oil throughput over the refinery's wharf is replacing declining SJVP crude deliveries, but it is limited to only 51,182 b/d. (Id.) Semi-refined oils delivered via upgrading of crude by the SMF, the only other way Rodeo gets oil feedstock, averaged ≈38,000 b/d as SMF crude throughput from 2010–2012 and could increase to 48,950 b/d, roughly the same throughput as the new wharf limit, with the proposed Throughput Increase.[21]

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[16] Expert report of Phyllis Fox (Fox Rail Spur Rpt–2), attached to CBE 5 Dec 2014 comments.
[17] RDEIR at 3-28.
[18] *See* Rail Spur RDEIR at 2-36 (need for project driven by declines in local crude sources).
[19] *See* BAAQMD, 2012. *Marine Terminal Offload Limit Revision Project CEQA Initial Study* at i, 1–3, 17 (crude and gas oil offloading limit increase of 20,500 b/d to 51,182 b/d to replace equal volume of California crude via pipeline, based on CSLC 1995 EIR); and CLSC 1995 FEIR (SCH #91053082) at § 4 page S-4 ("it is assumed that sources of San Joaquin" and "Alaskan crude, will decline" and "[m]ore reliance will be placed on crude imports from foreign sources"). *See* also Phillips 66 Chairman and CEO Greg Garland, quoted in Thompson Reuters, *DECEMBER 13, 2012 / 01:30PM, PSX – Phillips 66 First Annual Analyst Meeting;* www.streetevents.com ("opportunity to improve performance in California is really around getting advantage crudes to the front end of the California refineries").
[20] BAAQMD, 2012 and CSLC, 1995 as cited above.
[21] *See* Rail Spur RDEIR at 2-35.

20. Abundant evidence that the RDEIR does not include or analyze demonstrates that declining local and regional crude production could greatly affect SMF operation.[22] Total California crude production supplied to refineries statewide has declined by 43% from its peak of 1.10 million barrels per day in 1986 to 631 thousand barrels/day (Mb/d) in 2013, and California crude now supplies only 40% of statewide refinery crude input.[23] Statewide, coastal onshore production was 137 Mb/d in 1977 but only 60.3 Mb/d in 2012, indicating a gross decline of –56% and a year-on-year decline averaging –2.0%/year in this period.[24] State offshore production peaked in 1978 at 107 Mb/d and was 35.6 Mb/d in 2012, indicating a gross decline of –67% and a year-on-year decline averaging –3.6% per year.[25] In California's San Joaquin Basin, crude production peaked in 1986 at 745 Mb/d and was 405 Mb/d in 2012, a gross decline of –46% and annual decline averaging –2.3%/y.[26] California federal Outer Continental Shelf (OCS) production peaked in 1995 at 197 Mb/d and was 41.1 Mb/d in 2012, a gross decline of –79% and an average year-on-year decline during this period of –8.3%/y.[27] Some 13 Central Coast OCS, state offshore and onshore fields are identified as the sources of crude for the SMF.[28] Total production from these 'local supply' sources was 191 Mb/d in 1995 but only 67.1 Mb/d in 2012, a gross decline of –65% and a year-on-year decline ranging from –2.8%/y since 2003 to –5.8%/y since 1995.[29] See Figure 1. This 2.8–5.8%/year decline is within the range found elsewhere in the state that is discussed above (2.0–8.3%/y). As Figure 1 illustrates, this 2.8–5.8%/year rate of decline could result in total production from these 'local supply' sources falling below the maximum capacity of the SMF to process crude within a few years, and then falling further, to a small fraction of SMF design capacity, within the expected operating life of the proposed rail spur. When its crude rate falls too far below the design specifications of its existing equipment, such as its pipelines and vacuum unit, the existing SMF cannot operate efficiently or profitably.

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[22] This finding also applies to the Rodeo Facility of the Phillips 66 San Francisco Refinery.
[23] Cal. Energy Comm. (http://energyalmanac.ca.gov/petroleum/statistics/crude_oil_receipts).
[24] U.S. Energy Information Admin. (http://www.eia.gov/dnav/pet/pet_crd_pres_dcu_rcac_a.htm).
[25] U.S. EIA (http://www.eia.gov/dnav/pet/pet_crd_pres_dcu_rcasf_a.htm).
[26] U.S. EIA (http://www.eia.gov/dnav/pet/pet_crd_pres_dcu_rcaj_a.htm).
[27] U.S. EIA (http://tonto.eia.gov/dnav/pet/hist/LeafHandler.ashx?PET&s=RCRR10R5F+1&f=A).
[28] The Pt. Pedernales, Pt. Arguello, Santa Ynez, Elwood S. Offshore, Arroyo Grande, San Ardo, Cat Canyon, Orcutt, Santa Maria Valley, Lompoc, Casmalia, McCool Ranch, and Zaca fields. Further, a pipeline system connected only to local oil fields "is currently the only way that the Phillips 66 [SMF] can receive crude oil." *See* Rail Spur RDEIR at 2-35.
[29] Data from State Division of Oil, Gas, & Geothermal Resources (DOGGR) and US DOI Bureau of Safety and Environmental Enforcement (BSEE). See Exhibit 1 Appended hereto.

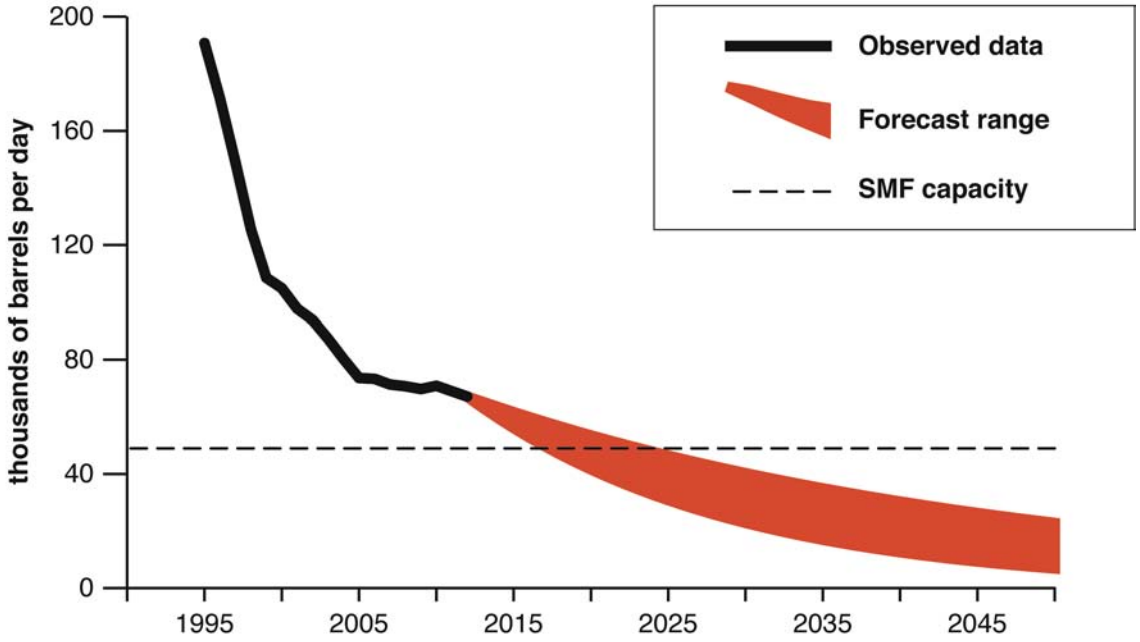


Figure 1. Total Central Coast OCS, offshore, and onshore oil production of fields supplying crude oil to the Phillips 66 SMF from 1995–2012, and forecast to 2050.

Observed production by year, in thousands of barrels per day (Mb/d)

1995	191 Mb/d	2001	97.7 Mb/d	2007	71.3 Mb/d
1996	171 Mb/d	2002	93.8 Mb/d	2008	70.7 Mb/d
1997	149 Mb/d	2003	87.3 Mb/d	2009	69.7 Mb/d
1998	126 Mb/d	2004	80.2 Mb/d	2010	70.9 Mb/d
1999	108 Mb/d	2005	73.6 Mb/d	2011	69.0 Mb/d
2000	105 Mb/d	2006	73.3 Mb/d	2012	67.1 Mb/d

Data from Cal. Dept. of Conservation (DOGGR) and U.S. Dept. of Interior (BSEE); *see* Exhibit 1 for details. Oil fields included are Pt. Pedernales, Pt. Arguello, Santa Ynez, Elwood S. Offshore, Arroyo Grande, San Ardo, Cat Canyon, Orcutt, Santa Maria Valley, Lompoc, Casmalia, McCool Ranch, and Zaca.
Forecast range based on range of average year-on-year decline rates (2.8–5.8%/yr) from a more recent (2003–2012) and longer (1995–2012) period, after CEC method (*see* CEC-600-2010-002-SF at 138).
SMF capacity is Santa Maria Facility throughput proposed (48.95 Mb/d) from Rail Spur RDEIR at 2-35.

21. If built as proposed the project would be expected to have a useful operational duration of 30–50 years (until 2045–2065).[30] As shown in paragraph 20 and Figure 1, current crude sources supplying project feedstock would dwindle during this period.

[30] *See* Karras Rodeo Report-1 at paragraph 11. This estimate is consistent with those for similar refining equipment made in other CEQA reviews (Id.) and with San Luis Obispo County's estimate (Rail Spur RDEIR at 2-36). The RDEIR omits this crucial information about the project, but "amortizes construction emissions over a 30-year project lifetime" (RDEIR at 4.5-9).

22. As stated, available evidence indicates insufficient currently recoverable LPG, and even the RDEIR's unsupported overestimate of currently recoverable LPG is smaller than the project's design capacity. Processing the same oil feedstocks in smaller amounts will yield even less LPG. Thus, even if the RDEIR's unsupported overestimate is assumed—and even if the SMF does not shut down when its crude supply dwindles to a small fraction of its capacity—in the absence of a new crude source to replace dwindling current supplies from the SMF and SJVP during its operating life, the project could not be implemented as proposed.

23. Phillips' crude by rail proposal at the SMF would deliver ≈52,000 barrels per unit train and unload each train in ≈11.5 hours, so it could amply supply the new imported crude oil for the proposed throughput increase to 48.95 Mb/d.[31] Further, this proposal's asserted exclusion of Bakken crude, heated unloading equipment, weight limits on rail tanker car crude volume, and asserted crude sources,[32] together with the predominance of the tar sands among available crude sources of this type indicate that tar sands oil would most likely dominate the new crude feedstock enabled by the project. This would be a dramatic change in refinery feedstock: Tar sands bitumen is *fundamentally* different from heavy oil or conventional crude.[33]

24. In sum, Phillips' proposal to recover additional LPG from its crude feedstock is inextricably related to its proposal to replace currently dwindling crude feedstock with new feedstock that most likely will be dominated by fundamentally different bitumen-derived 'tar sands' oils. My previous comments found the reasonable potential that this project-related feedstock switch could result in significant potential catastrophic hazard, air quality, public health, and climate impacts.[34] Instead of addressing these potential impacts the RDEIR asserts the unsupported and erroneous conclusion that the project "has no connection to" the crude switch.[35] Therefore, its failure to disclose, describe, analyze and address this project-related change in oil feedstock and its environmental implications represents a fundamental flaw in the RDEIR.

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[31] *See* Rail Spur RDEIR at 2-22, 2-29 and 2-35.
[32] Rail Spur RDEIR at 2-1, 2-14, 2-15, 2-22 and 2-33.
[33] *See* Meyer et al., USGS Open-File Report 2007-1084 (http://pubs/usgs/gov/of/2007/) at 2.
[34] Karras Rodeo Report-1 at paragraphs 56–83.
[35] *See* paragraphs 13–23; *see* also FEIR at 3.2-130, response to comment that undisclosed changes in crude oils processed could create undisclosed environmental impacts: ("The DEIR did not address changes in crude oil use because … the objectives of this Project would be achieved irrespective of crude oil feedstock selection."). (Emphasis added.)

Project Scope

25. Phillips' Santa Maria and Rodeo facilities (SMF and RF, respectively) are interdependent parts of its San Francisco Refinery (SFR), and its SMF rail spur, SMF throughput increase, and RF LPG[36] proposals are interdependent parts of a larger project that has been piecemealed,[37] as shown below.

26. SFR is identified and reported as a single oil refinery comprised of the SMF and RF by government and industry authorities,[38] by San Luis Obispo County,[39] and by Phillips itself (see Phillips 66 website).[40] SFR's primary, and from Phillips' perspective essential, products are gasoline, diesel and jet fuel. (Id.) But the SMF does not make *any* finished gasoline, diesel, or jet fuel by itself, and lacks the hydroprocessing and naphtha reforming capacity necessary to do so—all of the SFR hydrocracking, hydrotreating, hydrogen production, and naphtha reforming capacity is at the RF.[41] Instead, Phillips 66 sends all of the partially upgraded feedstock that the SMF produces (gas oil and naphtha-pressure distillate) through a proprietary pipeline to the RF, where all of the SFR's finished gasoline, diesel and jet fuel is made and then shipped from the RF product pipelines and wharf for sales.[42] The SMF thus depends upon the RF for transport fuel production and financially sustainable operation.

27. The RF, in turn, relies on the SMF for sufficient feedstock delivery and deep conversion (coking) capacity. San Joaquin Valley Pipeline (SJVP) crude delivery to the RF is declining with declining San Joaquin Basin production (see paragraphs 19–20), and this decline has already driven a throughput increase at the RF wharf (BAAQMD,

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[36] 'Propane Recovery' proposal; SCH #2012072046; this RDEIR.
[37] These points are made in my expert report submitted to San Luis Obispo County as well.
[38] *Compare* refinery capacity reports by EIA (http://www.eia.gov/petroleum/refinerycapacity/) and *Oil & Gas Journal* (http://www.ogj.com/ogj-survey-downloads.html#worldref) to facility configuration and throughput reports by State Regional Water Quality Control board permits (Order R3-2013-0028 at Table F-9 and Order R2-2010-0027 at Table F-1C); *see* also Rail Spur RDEIR at 2-32; Throughput Increase FEIR at 2-12; and RDEIR at 3-10 through 3-19.
[39] *See* Rail Spur RDEIR at 2-4; Throughput Increase FEIR at 2-1. Notably, the RDEIR's only references to the SFR are in its reference titles and a footnote on page 1-3 regarding changes of ownership: it fails to disclose that the RF is a component of a single, larger refinery, the SFR.
[40] www.phillips66.com/EN/about/our-businesses/refining-marketing/refining/Pages/index.aspx
[41] *Compare* refinery capacity reports and facility-level orders and EIRs cited in the note above.
[42] *See* Rail Spur RDEIR at 2-4 and the Throughput Increase FEIR at 2-1; s*ee* also the product export facilities discussion in the RDEIR at 3-18. The SMF was sited on the Central Coast to tap local crude sources there. This, together with San Francisco Bay/Delta tanker port capacity afforded to the RF, helps explain the SFR's geographically unusual design.

2012).[43] Even with this new wharf capacity, however, oil delivery across the wharf is limited to only 51.2 Mb/d. (Id.) Crude delivery and upgrading via the SMF—the only other way the SFR receives crude—is a substantial portion (≈38.0 Mb/d[44]) of its total crude supply. All SFR crude input is necessarily finished at the RF to make a financially sustainable product slate (see paragraph 26), so the SFR, and thus the RF, needs this SMF-derived crude. Moreover, roughly half of the coking capacity utilized by the SFR currently is at the SMF.[45] The RF needs this additional deep conversion capacity at SMF to feed its hydrocrackers sufficient heavy gas oil for the SFR to convert its crude slate into gasoline, diesel, and jet fuel efficiently and, from Phillips' standpoint, economically. Indeed, the new heavy gas oil hydrocracker at the RF that is fed this SMF gas oil[46] was built for exactly that purpose,[47] and could become a stranded asset without that feed.

28. Similarly, the SMF relies on existing infrastructure for feedstock. The SMF relies on a pipeline system fed by declining local crude supplies that cannot maintain its current crude rate for long, much less sustain a crude rate increase of ≈29% to 48.95 Mb/d, the proposed throughput increase—but the rail proposal could do so. (Paragraphs 20–23.)[48] In the absence of a new port, interstate pipeline, long-distance trucking plan, or any other credible proposal for sustained delivery of sufficient imported crude to implement this project component, the proposed throughput increase is dependent upon the rail spur.

29. A third component of the piecemealed project involves propane and butane, which are liquefied petroleum gases (LPG).[49] LPG is in refiners' hydrocarbon streams because it distills out from oil feeds, and because it is created in coking, hydrocracking, and other refining processes that 'crack' (break apart) larger, denser, or higher boiling-point hydrocarbons in the oil feeds. LPG is burned as refinery fuel, recovered, or both. Not all LPG present in all refinery hydrocarbon streams is recoverable with currently

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[43] See BAAQMD, 2012. *Marine Terminal Offload Limit Revision Project CEQA Initial Study* at i, 1–3, 17 (*crude and gas* oil offloading limit increase of 20,500 b/d to 51,182 b/d to replace equal volume California *crude* via pipeline, based on CSLC 1995 EIR); and CLSC 1995 FEIR (SCH #91053082) at Section 4 page S-4 ("it is assumed that sources of San Joaquin" and "Alaskan crude, will decline" and "[m]ore reliance will be placed on crude imports from foreign sources").
[44] From 37,785 b/d (2010), 38,701 b/d (2011), and 37,602 b/d (2012); Rail Spur RDEIR at 2-35.
[45] From 23,200 b/d (Order R3-2013-0028 Table F-9) v. 47,000–48,000 b/cd (*Oil & Gas J.*; EIA).
[46] See RDEIR at 3-10 through 3-12.
[47] See 'Clean Fuels Expansion' Nov. 2006 Prelim. EIR SCH #2005092028 at 3-1, 3-18, 3-22/23.
[48] See also Rail Spur RDEIR at 2-35 (pipeline system from local oil fields "is currently the only way that the Phillips 66 [SMF] can receive crude oil").
[49] Herein, 'LPG' means propane and butane, the only gases Phillips proposes to recover.

available technology. Propane and butane that is recovered can be sold as fuel or as petrochemical feedstock, and butane can be blended into winter gasoline. As stated, Phillips 66 proposes to recover propane and additional butane at its RF. It proposes to install a hydrotreater, recovery columns, pressure storage bullets, and a rail loading spur and rack, and—decades after other refiners stopped exploiting the San Francisco Bay/Delta in this way—would expand Phillips' once-through cooling system. The three components of the project are in review or await final approval before Contra Costa County or San Luis Obispo County and none of them has been implemented.

30. The publicly verifiable data in the record indicate that insufficient propane and butane is recoverable in the project baseline to implement Phillips' LPG proposal without the additional cracking process feedstock, additional LPG-rich naphtha/pressure distillate, or both, that its SMF throughput increase and rail spur could supply. My past comments, and those of others, raised and documented this finding. Unfortunately, instead of reporting and analyzing publicly verifiable data on current and potential sources of recoverable LPG, the counties' environmental reviews, thus far, have dismissed those comments with unsupported and contradictory assertions. (See paragraph 16.)

31. The new argument that vapor pressure limits do not allow any more LPG to be sent from the SMF to Rodeo[50] is totally unsupported by any data in the RDEIR, improbable, and shown by data the RDEIR omits to be erroneous. (See paragraph 17.) This 'vapor pressure' argument also ignores, and thereby distracts from a crucial point: LPG feedstock sent to Rodeo not as LPG, but as gas oils and pressure distillate (naphtha), yields substantial amounts of recoverable LPG from processing at Rodeo. Ignoring this link between the facilities' project components would be a fatal error.

32. Some of the volumetric implications for RF hydrocracking and reforming of gas oil and naphtha in a 'SMF projects' scenario, in which the rail and throughput proposals are implemented, and in a 'No SMF projects' scenario, in which those proposals are not implemented, are summarized in Table 1. Gas oil and naphtha/pressure distillate are the major SMF exports to the RF. Gas oils are hydrocracked at the RF to make gasoline, diesel, and jet fuel sized hydrocarbon molecules with high enough hydrogen:carbon ratios

[50] RDEIR at 3-25, 2-36. *See also Response to Appeals by the Rodeo Citizens Association and Communities for a Better Environment;* letter from Mark E. Evans, Phillips 66 San Francisco Refinery Manager, to Chair Karen Mitchoff and Members of the Contra Costa County Board of Supervisors. 6 January 2014; and Rail Spur RDEIR at 2-31.

Table 1. Estimated oil feedstock effects at the refinery's Rodeo Facility in 'project' and no project' scenarios for the Santa Maria crude by rail and throughput increase.
Figures EXCLUDE additional LPG-boosting effects of tar sands 'dilbit' processing*

Data in thousands of barrels/day (Mb/d), and percent

	Current conditions	Santa Maria Project Component Scenarios	
		SMF projects	No SMF projects
Santa Maria Facility			
crude throughput (Mb/d)	38.00	48.95	17.82
Δ vs. current (%)	——	29%	-53%
naphtha to Rodeo (Mb/d)	11.63	15.00	5.45
% Δ vs. current	——	29%	-53%
gas oil to Rodeo (Mb/d)	20.71	26.68	9.71
% Δ vs. current	——	29%	-53%
Rodeo Facility			
hydrocracking			
capacity (Mb/d)	58.00	58.00	58.00
feed rate (Mb/d)	51.75	57.72	40.75
utilization rate (%)	89%	99%	70%
Δ in feed rate (%)	——	11%	-21%
naphtha reforming			
capacity (Mb/d)	31.00	31.00	31.00
feed rate (Mb/d)	29.40	32.77	23.22
utilization rate (%)	95%	106%	75%
Δ in feed rate (%)	——	11%	-21%

Current crude rate is the 2010–2012 avg. of data from Rail Spur RDEIR at 2-35; SMF projects crude rate is the proposed Throughput Increase. (Id.) 'No SMF projects' crude rate is from the median year-2045 forecast illustrated in Figure 1 and the conservative assumption that all crude produced by Central Coast OCS, state offshore and onshore oil fields now identified as SMF suppliers will be supplied to the SMF (other plants received 45% of total production from these oil fields during 2010–2012). SMF naptha and gas oil supplied to Rodeo are throughputs reported by the SLOAPCD emission inventory, for all SMF plant naphtha and gas oil product tanks. This SLOAPCD data appear reasonable based on design performance and measurements of similar processes and crude slates as those at the SMF. Rodeo 2014 capacities in b/cd from USEIA (http://www.eia.gov/petroleum/data.cfm); Rodeo feed rates are multi-year averages from SFRWQB NPDES Order R2-2011-0027. Scenario feed rates are based on changes in gas oil (HCU) or naphtha (CRU) feed rate.

** Effects of LPG-rich diluents and harder-to-crack bitumen in tar sands dilbits (not shown in the table) would greatly boost LPG-per-barrel processed in the 'SMF projects' scenario.

for these high-value products—and yield significant amounts of propane and butane in this process. The gasoline stream (naphtha) must also be ‘reformed’ to boost octane rating, and thus is processed via catalytic naphtha reforming at the RF. The table shows changes from current (2010–2012) conditions in both scenarios identified above.

33. As stated, available evidence indicates insufficient currently recoverable LPG, and estimates based on publicly verifiable data for LPG known to be recoverable with available technology indicate that roughly half of Phillip's proposed LPG recovery capacity would be idle in these 'baseline' conditions. (See Paragraph 16.) Implementing the SMF throughput increase and rail components, however, would boost its naphtha and gas oil deliveries to Rodeo by ≈29% and boost *total* RF gas oil hydrocracking by ≈11%. See Table 1. Because hydrocracking is a significant LPG producer, LPG available for recovery at the RF would increase proportionately more than this 11%. Recoverable LPG would increase still more from the additional coking (not shown) of 29% more crude feed and, given that tar sands dilbits are the most likely new crude feed, from the LPG-rich diluents in these dilbits. (See Fox comments.) The sum of these increments could boost recoverable LPG at Rodeo from roughly 50% to more than 70% of the proposed project's design capacity.

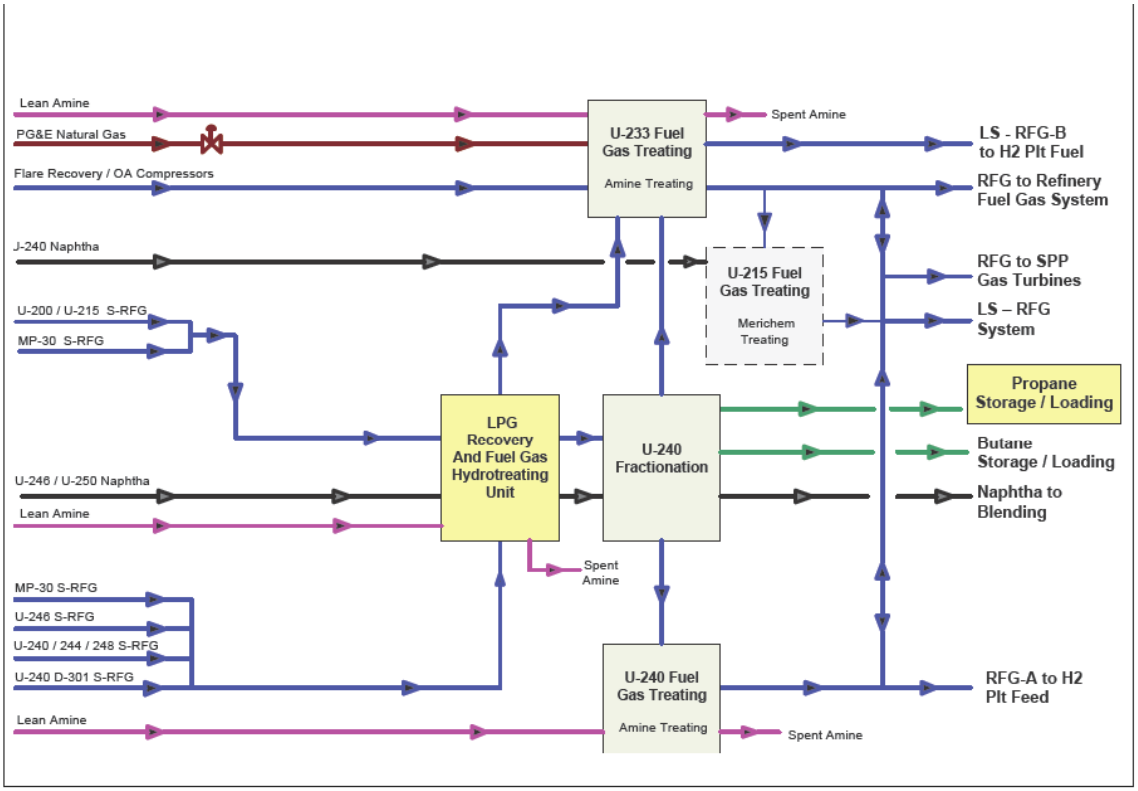
34. In the 'No SMF projects' scenario, SMF crude throughput would rely on terminally declining local/regional crude supplies and would decline as illustrated in Figure 1. A conservative (less steep) estimate of this decline and its effects on processing is described in Table 1 (see caption), for the time frame roughly around 2045, which is within the project duration (see paragraph 21). SMF-to-RF naphtha and gas oil volumes drop by about half and *total* RF gas oil hydrocracking drops by ≈21%. This is a conservative estimate; if it does not replace its already-declining crude feedstock supply by then, the SMF might more likely be shut down by 2045. (See Figure 1.)

35. The RDEIR's revised estimate of currently recoverable LPG suggests a small shortfall below the project design basis, ranging from 10–31% of project capacity being idled, depending upon the averaging period chosen. (See Paragraph 16.) This estimate is not supported by publicly verifiable data and overestimates recoverable LPG by applying maximum conditions as average ones and including LPG streams that are not feasible to recover in its 'recoverable' estimate. (Id.) Even if the RDEIR's overestimate is assumed, however, the 21% reduction in gas oil hydrocracking in the 'No SMF projects' scenario and the further LPG supply losses from idled coking and distillation capacity at the SMF could reduce LPG at the RF enough to idle roughly 40–50% of the proposed project capacity. Thus, the project cannot be implemented as proposed in the 'No SMF projects' scenario. Therefore, the Rodeo LPG component of the project depends upon the SMF throughput increase and crude by rail components for feedstock.

36. Importantly, an otherwise unexplained change in the project description is informed by the 'current conditions' and 'SMF project' results for naphtha in Table 1. Naphtha from the Rodeo heavy gas oil hydrocracker (Unit 246) and the ULSD diesel hydrotreater (U250) is routed through the proposed new 'fuel gas' hydrotreater in Revised Figure 3-6 of the RDEIR. These streams were routed through the proposed LPG recovery but *not* the proposed new hydrotreater in Figure 3-6 of the June 2013 DEIR. Further, these U246 and U250 streams are 'wild naphtha' derived at least in part from processing the SMF gas oil ('SMGO;' see Figure 3-4.[51]) Finally, these wild naphtha streams are now fed through other processes to reforming units U231 and U244 (see Figure 3-4), but revised Figure 3-6 shows the project re-routing them to naphtha blending instead. In sum, these naphtha streams are fed to the Rodeo reformers now but the revised LPG recovery proposal would instead route them through the new hydrotreater. For convenient review, RDEIR Revised Figure 3-6, RDEIR Figure 3-4, and original Figure 3-6 from the June 2013 DEIR are excerpted below.

37. The 'current conditions' and 'SMR projects' results for naphtha reforming in Table 1 are relevant to this project revision because they show that the Rodeo reformers are currently near maximum capacity (95% of 31.0 Mb/d) and would violate this maximum capacity limit if the SMF project components are fully implemented (106% of capacity). Further, the estimate in Table 1 probably underestimates this problem by conservatively assuming none of the expected further increase in naphtha inputs from the diluent in tar sands dilbits, though the throughput increase cannot be implemented without the rail spur, which would most likely tap these price-discounted and LPG-rich oil feeds. In any case, the units probably could not run properly, efficiently *and* safely if run beyond maximum capacity on a sustained basis, and either selling low-value unfinished naphtha into the new shale oil-dominated crude market at a deep discount, or cutting crude rate because of this limitation, could be costly. It also would mean that the throughput increase project could not be fully implemented. Routing some of the naphtha from the SMF to the new hydrotreater instead would relieve the bottleneck while allowing those streams to be part of the finished product slate—and that is what the LPG project revision described in paragraph 36 would do. Thus, the LPG component of the project enables full implementation of the SMF components.

[51] *See* also the comments of Phyllis Fox regarding the 'Propane Recovery' DEIR.

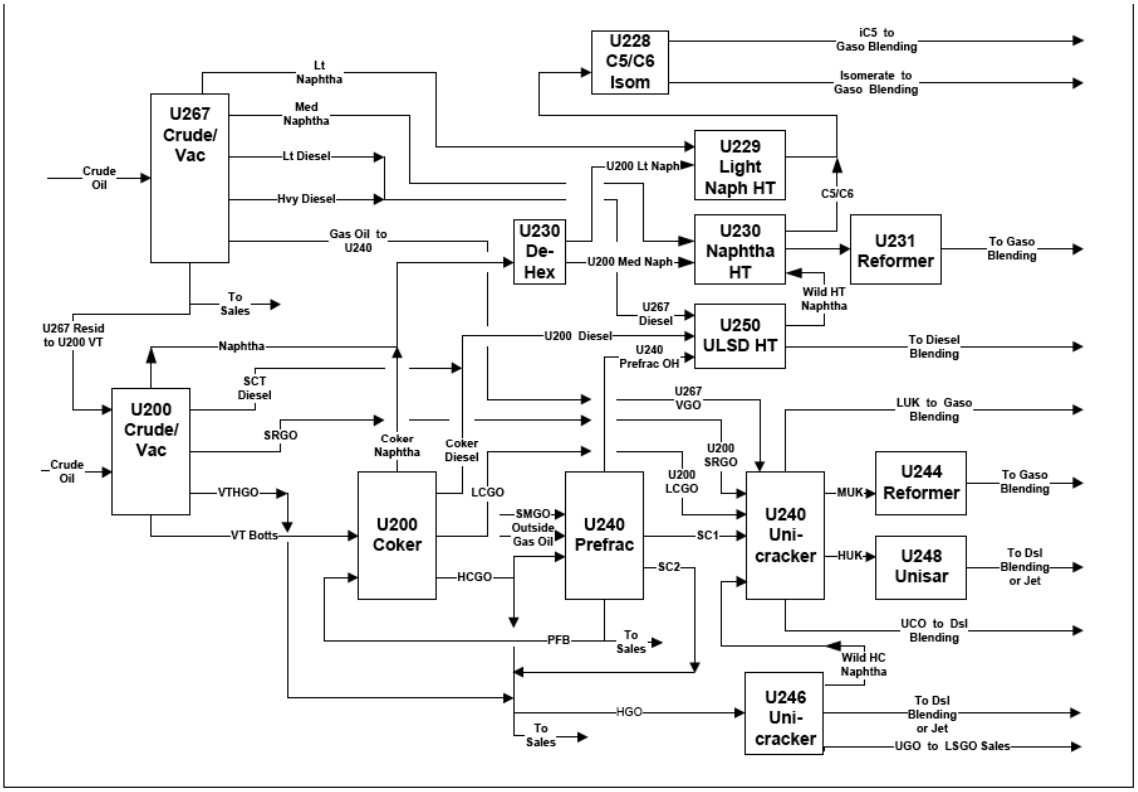


SOURCE: Phillips 66 Company

Phillips 66 Propane Recovery Project . 120546

Figure 3-6 Revised

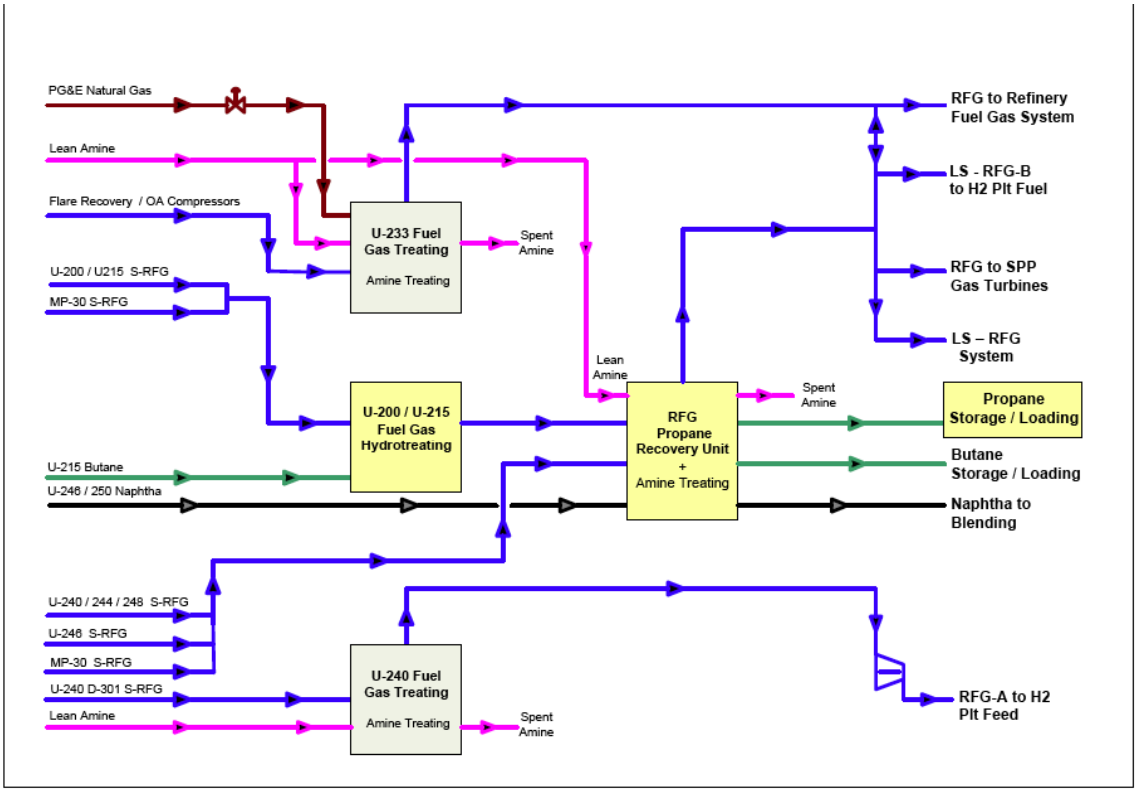
Proposed Refinery Fuel Gas System Block Flow Diagram



SOURCE: Phillips 66 Company

Phillips 66 Propane Recovery Project . 120546

Figure 3-4
Overall Block Flow Diagram of Refinery



SOURCE: Phillips 66 Company

Phillips 66 Propane Recovery Project . 120546

Figure 3-6

Proposed Refinery Fuel Gas System Block Flow Diagram

38. As discussed in paragraphs 25–37, the San Francisco Refinery's proposed 'projects' in Santa Maria and Rodeo are inextricably interrelated. The Santa Maria throughput increase is dependent upon the crude by rail proposal, the Rodeo LPG recovery/hydrotreater proposal is dependent upon those Santa Maria components, and those throughput increase and crude by rail components are dependent upon the new Rodeo hydrotreater for full project implementation. Therefore, the crude throughput rate increase, crude by rail, and LPG recovery proposals are interdependent parts of a single project of larger scope that has been piecemealed.

39. The failure to evaluate this project as a whole results in underestimating the scope and severity of identified impacts. The greater climate-disrupting emissions, toxic air contaminant emissions, smog-forming emissions, and safety hazards of project crude oil trains to the SMF *and* LPG trains from Rodeo, in combination and on many of the same routes, are examples of this underestimation. It further results in failure to identify some impacts at all, such as the toxic, smog-forming, and climate-disrupting emissions from refining larger volumes of crude feedstock, and those from switching to processing of bitumen oils. These 'tar sands' oils are extremely dense, refractory and contaminated and require substantially more energy, and fuel combustion for that energy, per barrel refined, thereby greatly boosting refinery emissions intensity and process safety hazard.[52] Equally important, evaluating the project only one piece at a time results in failure to identify feasible means to lessen or avoid impacts. For example, the switch to tar sands oil that is clear when the project is viewed as a whole would result in significant potential impacts from *refining* (in addition to the project's significant potential impacts along the mainline rails). Thus, the County clearly *can*—and indeed, *should*—consider choosing to demand that Phillips 66 refrain from the most dangerous and polluting type of oil known. But the RDEIR mentions no such mitigation. In short, the piecemealing of this project is a fundamental flaw in the RDEIR.

[52] My previous comments found the reasonable potential that this project-related feedstock switch could result in significant potential catastrophic hazard, air quality, public health, and climate impacts. (Karras Rodeo Report-1 at paragraphs 56–83.)

Project Impacts

40. All of the potential impacts associated with the changes in oil feedstock at the SFR's SMF and RF and the changes in the oil and LPG rail transport to and from these facilities that are identified in my comments[53] and those of Dr. Fox are also cumulative impacts of Phillips' throughput increase, crude by rail, and LPG recovery proposals. The RDEIR's failure to disclose, evaluate, or mitigate these potential impacts is unsupported and inappropriate, as discussed in paragraphs 12–39.

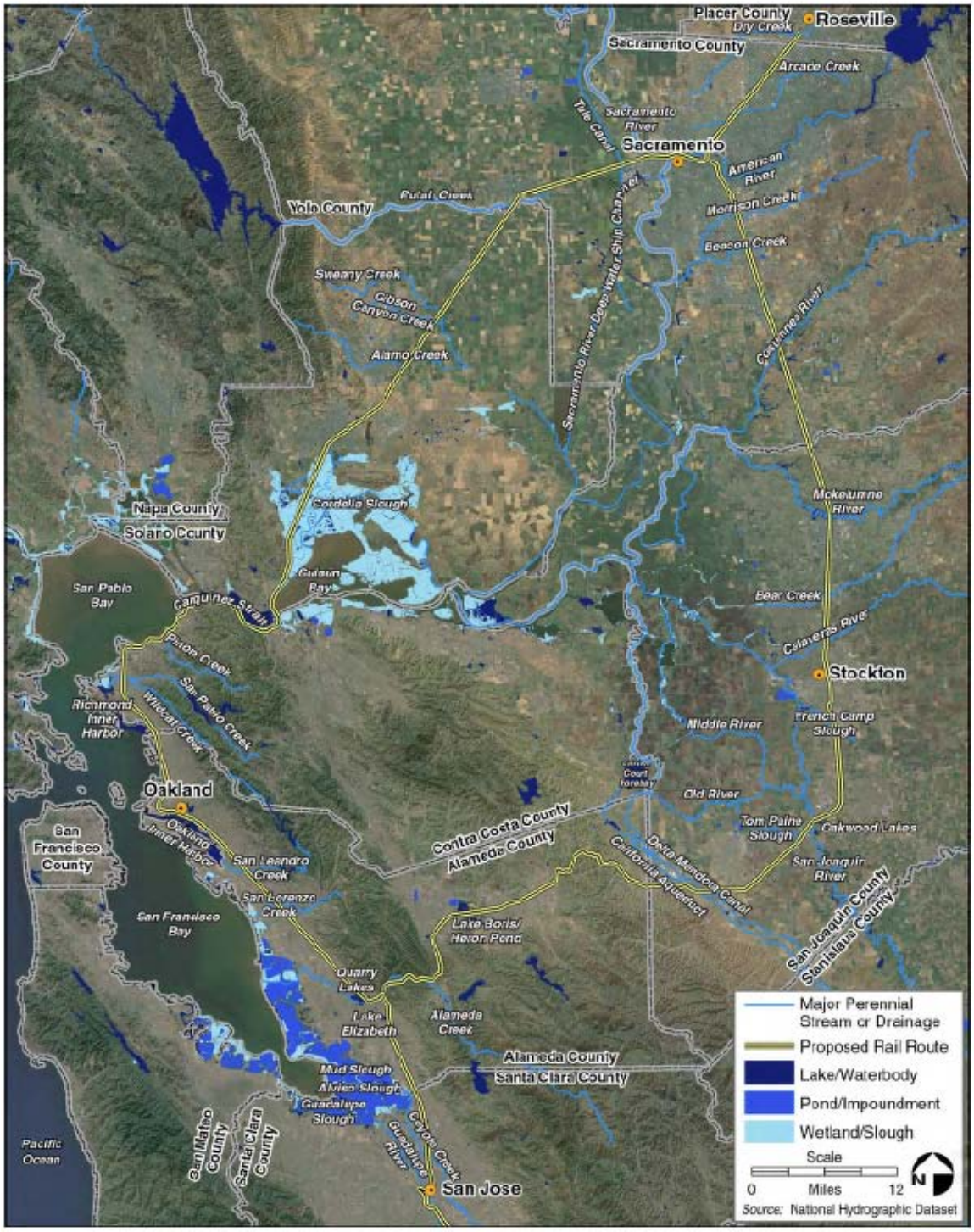
41. CBE learned of Kinder Morgan's new crude by rail terminal in Richmond following my previous comments in this matter. This terminal is adjacent to the Port of Richmond and aligned with rail routes that the project would be expected to use for LPG transport from the RF and crude transport to the SMF.[54] A map of the mainline routes from Roseville through Rodeo, Richmond and other Bay Area communities on the way toward the SMF is excerpted from the Rail Spur RDEIR below. The RDEIR does not include this terminal in its cumulative impact analysis,[55] does not say whether crude delivered by rail to the SMF might be loaded at this terminal, Richmond's port, or both, and does not appear to mention the Kinder Morgan crude by rail terminal at all.[56]

42. Phillips' proposal and route for diluted bitumen by rail to the project are now revealed more clearly. (See paragraphs 19–23; Rail Spur RDEIR at 4.13-9.) Bitumen poses a different and more severe spill hazard for water quality and aquatic life than conventional crude. It is denser than water and sinks to the bottom when spilled into water. Aquatic remediation by surface skimming does not work on these tar sands oil spills; they are effectively impossible to 'clean up,' worsening aquatic spill impacts. Compounding the hazard, the project would bring crude oil trains through the unique aquatic habitats of the San Francisco Bay/Delta. (See map, next page.) There is a reasonable potential that this could result in significant impacts to Bay/Delta ecosystems from tar sands oil spills in derailments of project-bound crude oil trains. The RDEIR does not disclose or address these potential impacts of the project on the Bay/Delta.

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[53] My previous comments found the reasonable potential that these project-related changes in oil feedstock could result in significant potential catastrophic hazard, air quality, public health, and climate impacts. (Karras Rodeo Report-1 at paragraphs 56–83.)
[54] *See* RDEIR at 4.3-9 and 4.3-10; Rail Spur RDEIR at 4.13-9.
[55] *See* RDEIR Table 5-1.
[56] A search of the RDEIR on "Kinder Morgan" returned a "no matches were found" result.

Figure 4.13-5 Mainline Route Water Bodies, Roseville to San Jose



43. Garbage in–garbage out errors continue to plague the Health Risk Assessment (HRA) in the RDEIR. In one example that is a fatal flaw in the HRA by itself, the emissions estimates used in the HRA drastically underestimate potential emissions associated with the project. Failing to disclose and analyze emissions associated with the project-related change in crude feedstock discussed in paragraphs 12–40, the RDEIR excludes those emissions from its estimate, drastically underestimating the project's emission potential for multiple pollutants. Using those erroneously lower emissions estimates as inputs to the HRA forces the health impact results calculated for those emissions by the HRA to be erroneously less severe that the true project potential.

44. Interpretative problems still plague the HRA in the RDEIR as well. For example, despite the drastic underestimation discussed in paragraph 43, the RDEIR reports a per-million people cumulative cancer risk from exposures to toxic air contaminants for the project of ≈61/MM. (RDEIR at 4.1-34.) Impact screening thresholds for such general population involuntary exposures have generally ranged widely, from 1/MM to 100/MM, with most air districts in California using 10/MM to 20/MM. Also, the Air District using 100/MM has publicly disavowed this outlier threshold as potentially under-protective.[57] The RDEIR, however, picks the 100/MM threshold without mentioning all of the more health-protective ones or that its choice has been disavowed, and concludes on that basis that the impact is 'less than significant.' (RDEIR at 4.1-14, 4.1-31, 4.1-34.) A more reasonable interpretation would reject the disavowed outlier in favor of a less extreme threshold, and note that the 61/MM HRA result exceeds it, indicating that the project has the reasonable potential to contribute to a significant cumulative air toxics impact.

45. The RDEIR's revised analysis of greenhouse gas (GHG) emissions fails to explain how—if offsite emissions from the project's LPG sales are too speculative to estimate as it claims—it can estimate them at a level of zero, particularly when this transforms a significant impact finding into a less-than-significant finding. (RDEIR at 4.5-13/14/15.)[58] This issue was addressed in my previous comments. An emission range

[57] *See* Staff presentations to the BAAQMD Board regarding the Petroleum Refinery Emissions Tracking Rule and Office of Health Hazard Assessment Update, Oct–Nov 2014.

[58] The RDEIR's estimate of zero metric tons per year emitted from the propane and butane sold and portion of that burned offsite is mathematically incontrovertible. *See* table on page 4.5-15: Subtracting the emissions caused by burning all of this LPG onsite (708,858 Mt/y) from those caused by burning the natural gas replacing that LPG onsite (592,792 Mt/y) yields a difference of –116,066 Mt/y, which is equal to the table's "net fuel source transfer combustion emissions." This equivalence (zero difference) proves the RDEIR estimates 0 Mt/y offsite LPG emissions.

could be estimated, and any credible estimate of offsite emissions from project sales of these LPG fuels must admit at least 10% of them could potentially be burned, which would reveal a significant impact. (See RDEIR Table 4.5-3.)

46. A project revision that appears to broaden the uses of the proposed expansion of once-through cooling (OTC)[59] emphasizes the point that this OTC expansion would be oversized for the project heat sources disclosed, and the question of whether that excess capacity is needed for heat from processing the project's changing oil feedstock. My previous comments raised this point and question.[60] The RDEIR's admission that the OTC expansion would be operated to boost heat discharge in proportion to Bay cooling water flow (RDEIR at 4.7-23), and its additional project revision to route naphtha produced in part from SMF oil feeds to Rodeo (paragraphs 10, 36–38), further emphasize this point and question. But the RDEIR continues the DEIR's failure to disclose the sources of this excess heat and their contributions to the excess, even as it changes the project description to broaden and further obscure this part of the project description.

47. My previous comments found that the DEIR underestimated project OTC impacts substantially by overestimating current average flow based on the erroneous assumption that a single recent year accurately represents current conditions, and provided detailed data supporting those findings. (Attachments 1 and 2.) I also noted that past monitoring of environmental conditions at lower OTC flow does not by itself predict impacts of the much greater proposed cooling water and heat flows. (Id.) Unfortunately, the RDEIR's revised discussion reasserts the same inflated OTC baseline and erroneous claim that a single recent year accurately represents current average conditions, fails to include any actual data supporting those assertions, and still relies on monitoring of past Bay conditions at lower OTC flows to predict project impacts.[61] The publicly verifiable data in the record (which the RDEIR thus ignores) indicate that instead of the 25% increase suggested by its inflated baseline, the project could increase OTC flow by 40–65%. (See Attachment 2.)

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[59] RDEIR at 3-37 vs. DEIR at 3-27; *see* also Paragraph 11.

[60] Attachment 1 at paragraphs 27–30.

[61] RDEIR at 4.2-27 through 4.2-29, 4.7-22 and 4.7-23. *See* esp. 4.7-22 (baseline assertions) and 4.2-29 and 4.7-23 (reliance on past monitoring). *See* also 4.2-29 (the size and dispersal of the impact plume is "primarily driven by tides *and output temperature and volume* [*emphasis added*]) and 4.2-27 (RDEIR analysis excludes impacts associated with effects on eggs and larvae of aquatic species that are not already listed as threatened or endangered).

48. The RDEIR's revised OTC discussion also asserts: "In 2005, the Refinery became the first company in California to successfully operate a wedgewire screened intake in a saltwater environment." (RDEIR at 4.2-28.) Strangely, the RDEIR omits mention of a more salient singularity: Phillips 66 is the only refiner that still exploits the San Francisco Bay/Delta by using once-through cooling.[62] The omission truncates the RDEIR's evaluation, obscuring facts about the environmental setting that would reveal additional impacts from the proposal to extend the operating duration of this antiquated technology and the feasibility of avoiding OTC impacts entirely as other refiners have done already. Moreover, the revelation that by extending OTC operation the project would cause impacts from the entire OTC flow exposes the fallacy of the argument that replacing OTC has no nexus to the project,[63] and further shows that the RDEIR's failure to analyze this alternative is unreasonable.

49. CBE has learned that, following my previous comments in this matter and the County's request for "Inherently Safer System study for the new process including storage and loading operations that includes the evaluation of alternatives listed in the Draft EIR"[64] Phillips 66 did perform that Inherently Safer System (ISS) analysis.[65] Crucially, the County's request for ISS analysis including "alternatives listed in the Draft EIR" referred to cooled storage—which may be inherently safer than the pressurized storage of LPG proposed, with respect to the specific hazard of catastrophic explosion (BLEVE). Proper ISS analysis would be based on Process Hazards Analysis (PHA), the rigorous analysis of process systems upon which current industrial safety practice relies, and ISS is an indispensable layer of protection that is higher in the hierarchy of safety controls, reflecting its importance. (See Chemical Safety Board, 2013.)[66] Thus, project-

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[62] *See* Attachment 1 at paragraphs 31 and 32. The two points are related: the intake screens were installed at the refinery *instead of* replacing OTC and even after this half measure was installed water quality officials required Phillips to investigate replacing OTC at Rodeo. (Id.)

[63] *See* RDEIR at 6-6 (closed loop cooling alternative to OTC not analyzed in RDEIR; analysis of alternative to OTC "for the Project's *additional cooling needs only*" [*emphasis added*]; this alternative "was not considered practical" and "was not considered further").

[64] 11 July 2013 letter from Michael Dossey, Accidental Release Prevention Engineer, Contra Costa Health Services, Hazardous Materials Programs, to Jim Ferris, Health and Safety Superintendent, Phillips 66 San Francisco Refinery, re; *Phillips 66 Propane Recovery Project (County File #LP12-2073).*

[65] Per. Comm. with Michael Kent, Hazardous Materials Ombudsman, Contra Costa County Health Services. 4 Dec 2014.

[66] U.S. Chemical Safety Board (CSB), 2013. *Interim Investigation Report: Chevron Richmond Refinery Fire; Chevron Richmond Refinery, Richmond, California, August 6, 2012.*

specific ISS analysis is essential to adequate evaluation of project hazards and the specific question of whether cooled instead of pressurized LPG storage is a safer alternative. My previous comments addressed this issue, noting the need for ISS analysis to be included in this CEQA review, and that the DEIR's concerns over costs of electricity and a new flare were misplaced, as there is no such cost exemption for otherwise feasible ISS.[67] Despite the reported availability of the ISS analysis to the County, the RDEIR still dismisses this alternative from further consideration based on exactly the same cost concerns expressed in the same words (RDEIR at 6-5 and 6-6), and it still does not include, disclose or even discuss this ISS analysis. (As CSB investigation reports demonstrate, this level of process safety detail can be released publicly without abridging confidentiality concerns.) This failure to disclose available information that is needed for an informed project decision about safety in the RDEIR appears improper.

50. Potential impacts of the change in hydrogen plant feedstock that is indicated by the RDEIR's revised project description (see Paragraph 9) are not analyzed or even discussed in the RDEIR's text. Hydrogen production is a major GHG emitter, and RF hydrogen plant process upsets, shutdowns for required maintenance, and shutdown/ startup design requirements are reported in BAAQMD Rule 12-12 causal analysis reports as recurrent causal factors in environmentally significant flaring at Rodeo.

51. An old issue merits critical attention. Potential benefits from reducing sulfur dioxide emissions by half, while that is achievable and important to achieve, could be unrealized if Phillips' and BAAQMD's stated plan[68] to proceed with emission reduction credits (ERCs) for this emission cut is not addressed. ERCs are a type of 'pollution trading' that could allow Phillips to increase those emissions again. I commented previously on this problem and suggested that the "County could consider developing a land use permit condition that ensures the 50% reduction in refinery wide SO_2 emissions identified in the DEIR will be real, measurable and permanent."[69] The RDEIR proposes no such measure. The RDEIR's assertion that this ephemeral emission reduction is a benefit of the project without addressing the foreseeable plan to potentially cancel out that claimed benefit through pollution trading is inaccurate and misleading.

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[67] Attachment 1 at paragraphs 39–44, 49, and 50.
[68] Air Permit Application at 17, Section 3.4 (Permit App Sections 1–3); and Per. Comm. with Jim Karas, BAAQMD at 4 Dec. 2013 Board Meeting (BAAQMD advised Phillips 66 to defer its ERC application and proceed with this step after project approval).
[69] Karras Rodeo Report-1 at paragraphs 26, 54.

Conclusions

52. Based on my knowledge, experience and expertise and the data, information and analysis discussed in this report, in my opinion:

- Project-related changes in San Francisco Refinery (SFR) oil feedstock sources, quantity, and quality are not disclosed in the RDEIR.
- The project would enable substantial changes in SFR oil feedstock sources, quantity, and quality and would most likely shift the SFR to refining fundamentally different 'tar sands' oils.
- The description of the project scope in the RDEIR is truncated, inaccurate, and misleading.
- Proposed LPG recovery and hydrotreating at the Rodeo Facility, crude throughput increase at the Santa Maria Facility, and crude by rail unloading at the Santa Maria Facility are inextricably related, interdependent components of a single project of larger scope that has been piecemealed.
- The project as revised in the RDEIR still has the reasonable potential to cause the significant adverse hazard, air pollution, public health, aquatic habitat destruction, and climate impacts identified in my prior comments in this matter, and the RDEIR does not identify, mitigate, or otherwise address adequately these significant potential impacts.
- The project has the reasonable potential to result in significant impacts that the RDEIR does not identify, mitigate, or otherwise address from oil spills in derailments resulting from project crude oil transport by rail across the San Francisco Bay/Delta.
- The project has the reasonable potential to contribute substantially to cumulative impacts that the RDEIR does not identify, mitigate, or otherwise address adequately.
- The RDEIR does not include adequate information about the project to identify other potential impacts, such as those associated with changes in hydrogen plant feedstock, although these impacts may be significant.
- The RDEIR does not include the information necessary to understand and evaluate the environmental implications of the project. It did not describe the duration, setting, geographic or processing scope, feedstock, operation, or potential environmental effects of the project accurately or, in many cases, did not describe them at all. These informational deficiencies are so profound, and the revisions needed to cure them so extensive, that full independent review of a comprehensively revised draft would be necessary before public decisions could be based with confidence on this project's environmental review.

53. I have given my opinions on these matters based on my knowledge, experience and expertise and the data, information and analysis discussed in this report.

I declare under penalty of perjury that the foregoing is true of my own knowledge, except as to those matters stated on information and belief, and as to those matters, I believe them to be true.

Executed this **_5th_** day of December 2014 at Oakland, California



Greg Karras

Comments

on the

Draft Environmental Impact Report (DEIR)

for the

Valero Benicia Crude by Rail Project

Benicia, California

September 15, 2014

Phyllis Fox, Ph.D., QEP, PE, DEE
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Rockledge, FL 32955
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321-626-6885

I have reviewed the Draft Environmental Impact Report (DEIR)[1] for the Valero Benicia Crude by Rail Project (CBR Project) prepared for the City of Benicia (City) by ESA, as well as records referenced in the DEIR and files obtained from the Bay Area Air Quality Management District (BAAQMD).

The CBR Project will install facilities to allow the Valero Benicia Refinery (Refinery) to receive up to 70,000 barrels per day (bbl/day) of North American crude oils by rail. The facilities that would be installed include about 8,880 feet of new track; a new tank car unloading rack capable of unloading two parallel rows of tank cars simultaneously; and 4,000 feet of 16-inch diameter crude oil pipeline and associated fugitive components (valves, flanges, pumps) connecting the offloading rack and an existing crude supply pipeline. DEIR, pp. ES-1 to ES-4.

Based on my review, I conclude this DEIR is fundamentally defective in that it omits crucial information to understanding the Project's significant impacts. Specifically, the DEIR does not disclose the Project's crude slate, relies on flawed analyses in addressing whether the Project would enable refining of substantial quantities of tar sands and Bakken crudes, relies on unsupported assumptions as to the Project's light crude composition, and underestimates the Project's operational emissions of reactive organic gases ("ROG") and toxic air contaminants ("TAC"). When these underestimates are corrected, the CBR Project results in significant air quality and public health impacts. The City must correct these defects and recirculate the DEIR, so that the public and decision-makers can be fully informed of the Project's air quality and public health and safety impacts.

My resume is included in Exhibit A to these Comments. I have over 40 years of experience in the field of environmental engineering, including air emissions and air pollution control; greenhouse gas (GHG) emission inventory and control; air quality management; water quality and water supply investigations; hazardous waste investigations; hazard investigations; risk of upset modeling; environmental permitting; nuisance investigations (odor, noise); environmental impact reports, including CEQA/NEPA documentation; risk assessments; and litigation support.

I have M.S. and Ph.D. degrees in environmental engineering from the University of California at Berkeley with minors in Hydrology and Mathematics. I am a licensed professional engineer (chemical, environmental) in five states, including California; a Board Certified Environmental Engineer, certified in Air Pollution Control by the American Academy of Environmental Engineers; and a Qualified Environmental Professional, certified by the Institute of Professional Environmental Practice.

[1] ESA, Valero Benicia Crude by Rail Project, Draft Environmental Impact Report, SCH # 2013052074, Use Permit Application 12PLN-00063, June 2014.

I have prepared comments, responses to comments and sections of EIRs for both proponents and opponents of projects on air quality, water supply, water quality, hazardous waste, public health, risk assessment, worker health and safety, odor, risk of upset, noise, land use and other areas for well over 100 CEQA documents. This work includes Environmental Impact Reports (EIRs), Negative Declarations (NDs), and Mitigated Negative Declarations (MNDs) for all California refineries; crude oil and rail terminals in California, Louisiana, Oregon, New York, Texas, and Washington; and various other permitting actions for tar sands and light shale crude refinery upgrades in Indiana, Louisiana, Michigan, Ohio, South Dakota, Utah, and Texas and liquefied natural gas (LNG) facilities in Texas, Louisiana, and New York.

My work has been cited in two published CEQA opinions: (1) *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (2001) 111 Cal.Rptr.2d 598 and *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310.

I commented on the Initial Study/Mitigated Negative Declaration (IS/MND) (attached to the DEIR as Appx. A[2]) that the CBR Project would allow a change in crude oil slate quality, to heavier higher sulfur crudes and/or to lighter sweeter crudes, which would result in emission increases that were not considered in the CEQA review. Fox IS/MND Comments[3], pp. 2-35. The DEIR does not correct the defects that I identified in my IS/MND comments. Rather, it advances an argument that the rail-imported crudes will be blended with other crudes to meet the same sulfur and weight specifications as in the baseline Refinery. Thus, the DEIR asserts that crude slate quality and emissions from refining it would not change. This is incorrect. This does not address my comments on the IS/MND. Therefore, I reassert my IS/MND comments and incorporate them here by reference. The following sections present my evaluation of the DEIR's response to my previous crude slate switch comments, point by point. The DEIR's response to my comments is included in Appendices C.1 and C.2, based on a report contained in Appendix K. The following comments on Appendices C.1 and C.2 apply equally to the underlying analyses in Appendix K.

[2] ESA, Valero Crude by Rail Project, Initial Study/Mitigated Negative Declaration, Use Permit Application 12PLN-00063, Prepared for City of Benicia, May 2013.

[3] Phyllis Fox, Comments on Initial Study/Mitigated Negative Declaration for the Valero Crude by Rail Project, Benicia, California, Use Permit Application 12PLN-00063, July 1, 2013; http://www.ci.benicia.ca.us/vertical/sites/%7B3436CBED-6A58-4FEF-BFDF-5F9331215932%7D/uploads/Report_by_Dr._Phyllis_Fox.pdf.

I. THE DEIR FAILS TO ANALYZE THE AIR QUALITY IMPACTS FROM REFINING DIFFERENT TYPES OF CRUDE

A. Heavy Sour Crudes

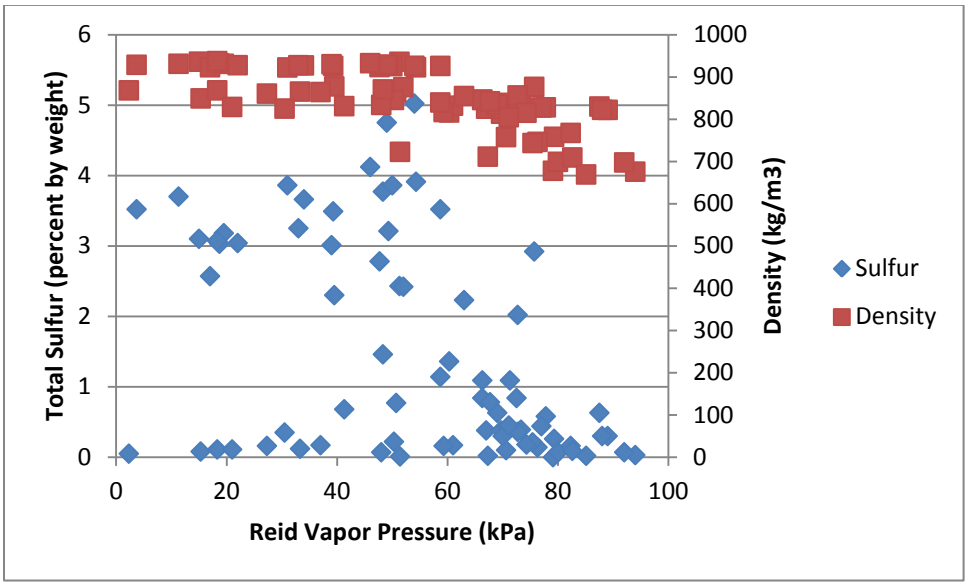
The CBR Project DEIR responds to the heavy sour crude slate issues that I raised in Appendix C.1. The thrust of the CBR Project DEIR's response is based on the "weight" (API gravity)[4] and sulfur content of the crude, which it argues would not change due to the Project, but rather would remain within a narrow range. Therefore, the CBR Project DEIR argues, emissions would not increase. The CBR Project DEIR argues: "Thus, to the extent that the Project would cause an increase in emissions based on an increase in the weight and sulfur content of crude feedstocks – any such emissions increase would be within the baseline environmental conditions." DEIR, Appx. C.1, p. C.1-3.

First, this misses the point, as explained in my previous comments at Section II.D, pp. 19-31. There are important differences between crudes that are not related to the weight and sulfur content of the crude that result in adverse impacts. Even if the weight and sulfur content of a particular crude blend fall within the range specified in the DEIR, or don't change at all, other components in the crude, such as TACs like benzene, or highly malodorous compounds such as mercaptans, may be present at much higher concentrations than in the crudes they replace with identical sulfur and API gravity.

Further, other characteristics of the crude, such as its vapor pressure or flammability, may differ in significant ways from the crudes they would replace. These other constituents and properties are not a function of the API gravity or the sulfur content and are present independent of them. The DEIR's consultant, Dr. McGovern, demonstrated there is no relationship between vapor pressure (expressed as RVP) and crude gravity (expressed as API). DEIR, Appx. K, p. K-18. This is further substantiated by analysis of data published by Enbridge, summarized here in Figure 1. The Enbridge data covering 76 different types of crude oil show that crude oil attributes of sulfur content and density are completely independent of vapor pressure.

[4] Note that throughout the DEIR, the term "weight" is used to indicate API gravity or density, where "density" is technically what is meant. We will use the same terminology in this report; "weight" indicates density.

Figure 1: Reid Vapor Pressure Compared to Total Sulfur and Density for 76 different types of Crude Oil



Source: Enbridge Pipelines Inc., 2013 Crude Characteristics, http://www.enbridge.com/~/media/www/Site%20Documents/Delivering%20Energy/2013%20Crude%20Characteristics.pdf

The vapor pressure of crude determines to a large extent the amount of ROG and TAC emissions that are emitted when it is transported, stored, and refined. Thus, a crude slate may have identical sulfur content and weight, but would result in dramatically different ROG and TAC emissions. Similarly, the nature of the chemical bonds in crude determines the amount of energy and hydrogen that must be supplied to refine it. Thus, a crude slate may have identical sulfur and weight, but a different mix of chemicals that would affect the amount of energy and hydrogen required to convert it into refined products.

These differences—in both chemical and physical characteristics other than API gravity and sulfur content— fluctuate independent of sulfur content and API gravity and will result in significant impacts that have not been considered in the DEIR. These impacts include, for example, significant increases in ROG emissions, contributing to existing violations of ozone ambient air quality standards; significant increases in TAC emissions, resulting in significant health impacts; significant increases in malodorous sulfur compounds, resulting in significant odor impacts; significant increases in combustion emissions, contributing to existing violations of ambient air quality standards; and significant increases in flammability and thus the potential for more dangerous accidents involving train derailments or spills on-site. The DEIR fails to consider these significant impacts by raising irrelevant issues.

Second, the rationale that sulfur levels and density of the crude slate would stay within a narrow range ignores the possibility of gradual creep within that range that would still be

significant. This recently occurred at the nearby Chevron Richmond Refinery. This refinery gradually changed crude slates, while staying within its established crude unit design basis for total weight percent sulfur of the blended feed to the crude unit.[5] This change increased corrosion rates in the 4-sidecut line, which led to a catastrophic pipe failure in the #4 Crude Unit on August 6, 2012. This accident sent 15,000 people from the surrounding area for medical treatment due to the release and resulting fire that created huge black clouds of pollution over the surrounding community. Fox IS/MND Comments, pp. 25–26.

These types of accidents can be reasonably expected to result from incorporating tar sands crudes into the Benicia crude slate, even if the range of sulfur and gravity of the crudes remain the same, unless significant upgrades in metallurgy occur, as these crudes have a significant concentration of sulfur in the heavy components of the crude coupled with high total acid number (TAN) and high solids, which aggravate corrosion. The gas oil and vacuum resid piping, for example, may not be able to withstand naphthenic acid or sulfidation corrosion from tar sands crudes, leading to catastrophic releases.[6] Fox IS/MND Comments, pp. 35-36.

Catastrophic releases of air pollution from these types of accidents were not considered in the DEIR. Rather, the DEIR relies on the Refinery's existing Process Safety Management program, including the Management of Change (MOC) and Mechanical Integrity (MI) programs, to prevent corrosion. DEIR, p. 3-16. However, these programs were also in place at Chevron at the time of the August 2012 accident discussed above, and they did not prevent a catastrophic accident caused by sulfur creep. The recent Chevron FEIR incorporated many additional mitigation measures to improve these programs,[7] which should be required for the Valero Rail Project.

Third, the unloading rack, storage tanks and associated fugitive components are major sources of the ROG and TAC emissions. These unload, transport, and store crude oil as delivered, before it is blended. Therefore, the argument that the rail-imported crude is blended before it is refined is irrelevant.

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[5] US Chemical Safety and Hazard Investigation Board, Chevron Richmond Refinery Pipe Rupture and Fire, August 6, 2012, p.34 ("While Chevron stayed under its established crude unit design basis for total wt. % sulfur of the blended feed to the crude unit, the sulfur composition significantly increased over time. This increase in sulfur composition likely increased corrosion rates in the 4-sidecut line.").

[6] See, for example, K. Turini, J. Turner, A. Chu, and S. Vaidyanathan, Processing Heavy Crudes in Existing Refineries. In: Proceedings of the AIChe Spring Meeting, Chicago, IL, American Institute of Chemical Engineers, New York, NY, Available at: http://www.aiche-fpd.org/listing/112.pdf.

[7] See, for example, Chevron Refinery Modernization Project, Revisions to Draft EIR Volumes 1& 2, p. 4-40, Mitigation Measure 4.13-7h, Available at: http://chevronmodernization.com/project-documents/.

1. The CBR Project DEIR Must Evaluate the Potential Impacts of the Full Range of Crude Oil Types That Could Be Imported

The CBR Project DEIR asserts: "There is no reason to believe that…Valero would be more likely to purchase heavy Canadian crudes than any number of other North American crudes that are lighter and/or sweeter…" DEIR, Appx. C.1, p. C.1-1. The CBR Project DEIR presents a table that lists 38 "available North American crudes" that could potentially be imported by the proposed rail facilities. DEIR, Table 3-1. Of these 38 crudes, 87% or 33 of them, are Canadian tar sands crudes and of the tar sands, 15 are "heavy sour" and 5 are "medium sour." Canadian tar sands crudes are chemically distinct from the current crude slate and thus will result in significant impacts that were not analyzed in the CBR Project DEIR. Fox IS/MND Comments, pp. 25-28. DEIR Table 3-1 is prima facie evidence that tar sands crudes are likely to be in the mix of crudes that will be imported by the CBR Project.

Regardless of which of these 38 crudes is selected, the DEIR must analyze the full range of resulting impacts, from all of the 38, as the DEIR suggests all or any of them may be refined. Impacts would vary greatly between tar sands crudes on the heavy high sulfur end and by Bakken crudes on the light sweet end, each end of this range with unique and significant impacts. The DEIR does not include impacts from either of these, but rather only an unidentified default crude that is not representative of any of the 38. See Comment III.

2. Blended Weight and Sulfur Content Do Not Determine ROG and TAC Emissions

The CBR Project DEIR argues that "even if Valero were to purchase large amounts of heavy sour Canadian crudes as a result of the Project, this would not cause an increase in refinery emissions because Valero must blend crude feedstocks to a narrow range of weight and sulfur content before processing them." DEIR, pp. 3-14, 3-24, 4.1-17, C.1-1/2. This is insufficient information to analyze impacts, as noted above, because the weight (API gravity) and sulfur content are not the only characteristics of crude oil that determine environmental impacts. Other important factors include volatility, flammability, metal content, ROG speciation profile, the specific suit of heavy organic compounds in the crude, and the TAC and sulfur speciation profile (i.e., the concentration of individual TAC and sulfur compounds present in the crude).

Elevated levels of benzene or hydrogen sulfide, for example, cannot be blended out because they are emitted from tanks and fugitive components before the crudes reach the mixing tanks. The majority of the toxic TACs and malodorous chemicals are emitted before blending occurs, during unloading and from fugitive components along the pipeline and at the storage tanks. Blending by itself does not eliminate them.

Similarly, elevated metals that end up in coke fugitive particulate emissions cannot be blended out. No matter how much blending is done with relatively less contaminated crudes, a significant amount of heavy metals from lower quality rail-imported crude would still remain, mostly partitioning to the coke. Blending also does not remove but only dilutes elevated concentrations of high molecular weight organic compounds such asphaltenes and resins that require high energy input to break down into marketable products. Fox IS/MND Comments, pp. 4-10. These characteristics may vary in significant ways among crudes with the same range of API gravity and sulfur, resulting in significant environmental impacts. Fox IS/MND Comments, pp. 29-30.

3. Crude Slate Impacts Are Not Part of the Baseline

The CBR Project DEIR indicates that Valero made significant modifications to the Refinery between 2004 and 2010. These modifications are collectively known as the "Valero Improvement Project" or VIP. The City certified the VIP project EIR and approved the VIP project in April 2003. It later certified the VIP EIR addendum in July 2008. DEIR, p. 3-12.

The CBR Project DEIR argues that crude slate impacts are part of the VIP baseline, "[e]ven if refinery emissions were to increase based on Valero's purchase of heavy sour Canadian crudes, any such emissions increases would properly be considered part of the baseline because the baseline includes the full scope of operation allowed under existing permits that were issued based upon prior CEQA review." DEIR, p. C.1-1. The DEIR cites several CEQA cases regarding subsequent environmental review for modifications to existing projects.

Setting aside legal considerations, this argument has no technical merits for three reasons. First, the scope of operations previously approved did not include any impacts from a crude slate change and did not contemplate the crudes listed in DEIR Table 3-1. Second, the CBR Project Project is not a modification of the previously permitted VIP, which underwent CEQA review. Third, even assuming the VIP EIR evaluated a crude slate change and the CBR Project is just a modification of the VIP, both of which are false, the regulatory framework has changed, requiring additional CEQA review.

a. The Scope of the VIP Project Did Not Include Impacts from Crude Slate Change

Even if the CBR Project were simply a modification of the VIP Project, the VIP EIR did not evaluate impacts from a crude slate change. The existence of permits, absent CEQA review of the proposed change, is not determinative.

The VIP CEQA documents do not discuss cost-advantaged North American crudes, such as those in CBR Project DEIR Table 3-1. None of these crudes is evaluated, or even identified,

in the VIP EIR. Thus, the impacts of refining these crudes were in no way considered or incorporated. Therefore, the CBR Project DEIR cannot rely on the VIP CEQA review to address the impacts of refining any of them. Rather, the VIP EIR proposed to import heavy sour crudes by ship. The crudes available by ship in 2002 are chemically and physically different from the crudes available by rail in 2014, over a decade later. The oil markets have changed dramatically due to the advent of fracking and the development of tar sands, all of which occurred long after the VIP EIR analyses were performed.

There are many cost-advantaged, heavy high sulfur crudes that likely were the target of the VIP analyses prepared in 2002, such as heavy sour crudes from Ecuador, Venezuela, Colombia and Iraq, which were refined at the post-VIP Refinery. Fox IS/MND Comments, Figure 1. These heavy sour crudes are distinguishable from the crudes that are currently the target of the CBR Project, which are tar sands crudes and light sweet crudes with distinct physical and chemical characteristics. DEIR, p. C.2-1. The crudes that are currently the target of the CBR Project (DEIR, Table 3-1) were not available in the marketplace in 2002 when the VIP CEQA analysis was performed and thus were not considered in prior CEQA analyses. The differences between the crudes considered in the VIP EIR and those that would be imported by the CBR Project are discussed in my July 2013 comments on the IS/MND.

There is no evidence that the VIP was designed to refine, and that the VIP CEQA review addressed, the unique impacts of refining any of the cost-advantaged North American crudes listed in DEIR Table 3-1. Further, the lynchpin of the VIP EIR, a new, bigger hydrogen plant to allow refining of more heavy sour crude, may not be built as Valero has enough hydrogen to meet its current needs. DEIR, p. 3-12. This could be due to the availability of hydrogen from another source or a change in crude slate to lighter crudes that do not require more hydrogen to refine.

Bakken and Bakken blends with tar sands crudes, for example, would fall into this class. Further, the rail emissions assume a line haul one-way distance of 1,500 miles (DEIR, p. 4.1-22 and Appx. E.5, pdf 1197), which is consistent with Bakken crudes. There is no evidence in the record that impacts from refining this lighter, sweeter crude were considered in the VIP EIR. These impacts are discussed below in Comment I.B.

b. The CBR Project Is a New Project

The City did not treat the CBR Project as a modification of a previously permitted project in the IS/MND, but rather as a new project. Furthermore, even the DEIR refers to the VIP as a "previous" project. DEIR at 1-4. The characterization of the CBR Project as a modification of the VIP Project in the DEIR for baseline purposes improperly characterizes the projects and causes the CBR Project DEIR to underestimate or ignore real environmental impacts.

c. The Regulatory Framework Has Changed, Requiring Additional CEQA Review

Even if one hypothetically assumed that the VIP EIR evaluated the crude slate switch facilitated by the CBR Project, the regulatory and informational framework within which the CBR Project would be developed has changed dramatically, rendering the 2002 analysis obsolete. The City certified the VIP project EIR and approved the VIP project in April 2003. It later certified a VIP EIR addendum in July 2008. DEIR, p. 3-12. The Addendum incorporated a flue gas change related to the Main Stack Scrubber and added an analysis of greenhouse gas emissions. These changes do not affect any of the issues discussed here.[8]

When the VIP CEQA analysis was performed, none of the cost-advantaged crudes listed in Table 3-1 were in the marketplace. In response to ESA questions, for example, Valero responded that the CBR Project "was implemented to take advantage of land-locked North American crudes that have **recently** become available." Valero 2013,[9] p. 1 (emphasis added). As discussed earlier, these crudes are notably different from the current crude slate, in ways that are much broader than just sulfur content and weight. Thus, none of the impacts of refining these physically and chemically distinct crudes could have been anticipated and evaluated in 2002 when the VIP CEQA analysis was performed. Further, as explained in my comments on the IS/MND, the regulatory framework has significantly changed, requiring additional CEQA review even if the Project were a modification of a project that had previously undergone CEQA review. Fox IS/MND Comments, pp. 33-34.

Since the VIP FEIR was certified in 2003, new scientific evidence about the potential adverse impacts of air pollutants has become available, and in response, new guidance has been published and several federal and state ambient air quality standards have been revised. These include:

- The 8-hour state ozone standard was approved by the California Air Resources Board (CARB) on April 28, 2005 and became effective on May 17, 2006;
- The U.S. Environmental Protection Agency (EPA) lowered the 24-hour PM2.5 (particulate matter equal to or smaller than 2.5 micrometers) standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006. EPA designated the Bay Area as nonattainment of this PM2.5 standard on October 8, 2009;
- On June 2, 2010, the EPA established a new 1-hour SO_2 (sulfur dioxide) standard, effective August 23, 2010;

[8] Valero Improvement Project, Addendum to VIP EIR, June 2008, Available at: http://www.ci.benicia.ca.us/vertical/sites/%7B3436CBED-6A58-4FEF-BFDF-5F9331215932%7D/uploads/%7B5A35F17D-5E23-404C-8032-6597BE84B5F9%7D.PDF.

[9] Valero Responses to: Valero Crude by Rail Project Data Request Number 2, April 2, 2013.

- The EPA promulgated a new 1-hour NO_2 (nitrogen dioxide) standard of 0.1 ppm, effective January 22, 2010;
- The EPA issued the greenhouse gas tailoring rule in May 2010, which requires controls of GHG emissions not contemplated in the VIP FEIR or the 2008 Addendum;
- The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure below which there are no adverse health effects determined;
- The EPA issued a final rule for a national lead standard, rolling 3-month average, on October 15, 2008. The Project would increase lead emissions. Fox IS/MND Comments, p. 1, 20;
- Various BAAQMD regulations, including Regulation 2-2 (adopted December 19, 2012); and
- BAAQMD is currently developing a regional refinery regulation that could require additional emission controls.

B. Light Sweet Crudes

Light sweet crudes such as Bakken could be imported by rail and could result in an increase in ROG and TAC emissions from storage tanks, pumps, compressors, valves, and connectors that were not considered in the IS/MND. Fox IS/MND Comments, pp. 11, 25-28. The CBR Project DEIR concedes that "[o]nce the Project is constructed and operational, Valero may well purchase large amounts of light sweet North American crudes. In fact, this is Valero's stated plan." DEIR, p. C.2-1. Elsewhere, the DEIR notes that "[o]nce the Project is complete, Valero plans to obtain North American crudes that are, on average, lighter and sweeter than Valero's current feedstocks. According to Valero, the North American crudes will be 'Alaskan North Slope (ANS) look-alikes or sweeter' (Valero, 2013)." DEIR, p. 3-24. The closest and most cost advantaged of light sweet North American crudes listed in Table 3-1 that could be blended to be an ANS look-alike is Bakken crude.

An ANS look-alike crude, for example, could be created by blending 55% Bakken and 45% Western Canadian Select at a cost potentially far less than the ANS market price. The resulting mix has the same API gravity and slightly higher sulfur than ANS, and virtually identical distillation yields.[10] Both of these crudes are listed as available North American crudes in the DEIR. DEIR, Table 3-1. See also DEIR, pp. K-16/17. Alternatively, some of the lighter crudes, such as Bakken, could be fed directly to refining units, such as the fluid catalytic cracking unit (FCCU), eliminating the need for blending. Thus, the DEIR must evaluate the

[10] John R. Auers and John Mayes, North American Production Boom Pushes Crude Blending, Oil & Gas Journal, May 6, 2013, Available at: http://www.ogj.com/articles/print/volume-111/issue-5/processing/north-american-production-boom-pushes.html.

impacts of importing by rail and processing both Bakken and tar sands crudes, which span the range of likely impacts.

1. Bakken Crudes Have Properties That Will Result in Significant Impacts Not Evaluated in the DEIR

The DEIR makes the same arguments as to weight and sulfur content as previously made with respect to heavy sour crudes. The DEIR asserts that refining 70,000 bbl/day of light sweet crude would not cause an increase in ROG emissions because: "(a) Valero must blend crude feedstocks to a narrow range of weight and sulfur content before processing them, and (b) therefore, the average weight and sulfur content of crudes delivered to the Refinery will remain the same. In other words, any deliveries of light North American crudes by rail would simply replace the delivery of other light crudes by ship." DEIR, p. C.2-1. This is wrong for two principal reasons.

First, this is wrong because most of the ROG and TACs are emitted before the crudes are blended, from the rail cars, unloading, pipeline fugitive components (valves, pumps, connectors), and crude storage tanks. According to the Project description, two unit trains, each potentially carrying Bakken crude oil, would be unloading within a 24-hour period. DEIR, p. 3-22. This would result in an increase in daily ROG and TAC emissions, regardless of blending downstream to meet ANS-lookalike quality.

Second, this is wrong because all light sweet crudes are not created equal. The average weight (API gravity) and amount of sulfur in light sweet crudes do not determine the amount of ROG and TACs that will be emitted from Refinery tanks, pumps, compressors, valves, and connectors. The DEIR is correct when it asserts that "there is no relationship between the weight of a particular crude oil and the amount of fugitive emissions released from equipment containing that crude oil." DEIR, p. C.2-1. See also Figure 1.

The amount of ROG and TAC emissions is determined by the "volatility" of the crude and the concentration of TACs within the crude, not by its weight or sulfur content. The volatility can vary widely for "light sweet crudes," independent of weight and sulfur content. Processing in the oil fields, in particular, significantly affects volatility of shipped crudes, as discussed below. Bakken crudes, which are likely to be imported by the CBR Project, have uniquely elevated volatility, which has led to many spectacular accidents, such as those that occurred at Lac-Mégantic[11]; Casselton, North Dakota[12]; Alabama[13]; and more recently, Lynchburg, Virginia.[14]

[11] NTSB, Safety Recommendation In reply refer to: R-14-4 through -6; January 21, 2014. Available at: http://www.ntsb.gov/doclib/recletters/2014/R-14-004-006.pdf.

Volatility is measured in pounds per square inch (psi) and is typically reported as Reid Vapor Pressure (RVP).[15] Vapor pressure is an indirect measure of the evaporation rate of volatile compounds in the crude oil, with higher vapor pressures indicating greater losses from evaporation. The DEIR neglected to disclose the well-known relationship between the vapor pressure of a crude and the amount of emissions released from equipment containing the crude,[16] which is incorporated into the EPA TANK 4.0.9d model, universally used to estimate ROG and TAC emissions from tanks, including in the DEIR for this Project.

The CBR Project would facilitate the import of Bakken crudes, which have uniquely elevated vapor pressures compared to the light sweet crudes they would replace. As discussed elsewhere in these comments, most of the imported crude that would be replaced is Alaska North Slope (ANS) crude (API gravity = 31.6^{o}, S = 0.96%) and similar or heavier foreign imports. The ANS crude has a Reid Vapor Pressure (RVP) of 6.3 psi.[17] Most foreign imports have an even lower RVP. In comparison, Bakken crudes (API gravity = 38-40°, S = 0.2%), the most likely replacement, have a RVP of up to 15.5 psi.[18] Thus, replacing ANS and foreign imports with Bakken would increase ROG and TAC emissions from tanks and fugitive sources by up to a factor of 2.5. The TAC emissions would increase even more as the concentration of TACs in the Table 3-1 crudes are much higher than in the current crude slate.

The volatility and TAC speciation information required to evaluate this crude switch, from ANS, to an ANS-look alike based on a Bakken blend, is completely absent from the DEIR. Vapor pressure and crude TAC speciation information are not confidential and are routinely

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[12] NTSB, Preliminary Report; DCA14MR004, 2014. Available at: https://www.ntsb.gov/doclib/reports/2014/Casselton_ND_Preliminary.pdf.

[13] Karlamangla, Soumya, "Train in Alabama oil spill was carrying 2.7 million gallons of crude." Los Angeles Times, http://articles.latimes.com/2013/nov/09/nation/la-na-nn-train-crash-alabama-oil-20131109, November 9, 2013.

[14] Los Angeles Times, May 1 2014, http://www.latimes.com/nation/nationnow/la-na-nn-ntsb-investigation-fiery-crude-oil-train-derailment-virginia-20140501-story.html.

[15] Measured by American Society for Testing and Materials Method ASTM D323-08, Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method) is used to determine the vapor pressure at 100 F with initial boiling point above 32 F.

[16] See AP-42, Section 7.1: Organic Liquid Storage Tanks.

[17] ExxonMobil Refining and Supply Company, ANS11U, Available at: http://www.exxonmobil.com/crudeoil/about_crudes_ans.aspx and http://www.exxonmobil.com/crudeoil/download/ans11u.pdf.

[18] Classification and Hazard Communication Provisions for Crude Oil – Bakken Crude Oil Data, June 13, 2014, Available at: http://www.unece.org/fileadmin/DAM/trans/doc/2014/dgac10c3/UN-SCETDG-45-INF26e.pdf; Dangerous Goods Transport Consulting, Inc., A Survey of Bakken Crude Oil Characteristics Assembled for the U.S. Department of Transportation, Submitted by American Fuel & Petrochemical Manufacturers, May 14, 2014, pp. 5, 19, Available for download from: https://www.afpm.org;

North Dakota Petroleum Council, Bakken Crude Quality Assurance Study, Available at: http://www.ndoil.org/image/cache/Summary_2.pdf;

included in public documents to support tank and fugitive emission calculations. Further, crude assay data is widely reported.[19] See, for example, the Tesoro Vancouver Application.[20]

The DEIR offers irrelevant information to support its theory, arguing that "the amount of fugitive emissions from a piece of equipment is a function of the mechanical integrity of the equipment and the pressure applied to its contents. The weight of the crude oil is not a factor." DEIR, p. C.2-2. While this is partially correct, in that the design of the equipment and the pressure exerted by the contained crude oil on this design are important factors that determine the amount of emissions during routine operations, it fails to acknowledge other key factors such as RVP and TAC concentrations in the crude discussed above. The DEIR must evaluate the foreseeable scenarios of both light sweet crude, including Bakken, and heavy sour crude, including tar sands.

The foreseeable switch from ANS and other current components of Valero's crude slate to a Bakken crude or a Bakken-tar sands mix, included in DEIR Table 3-1, is a feedstock change that should have been explicitly identified and evaluated in the DEIR. These new crudes are chemically and physically different from the current crude slate and the crude slate evaluated in the VIP EIR in ways that are not captured by exclusive consideration of crude slate sulfur content and API gravity. These differences will result in significant impacts not evaluated or disclosed in the CBR Project DEIR.

Bakken crudes have unique chemical and physical characteristics that distinguish them from currently refined crudes and which would result in significant environmental impacts not identified in the DEIR, including significant risk of upset, air quality, odor, and public health impacts. These unique characteristics include high volatility, flammability,[21] and elevated concentrations of TACs and ROG.

The amount of TACs and ROG released from storage tanks and fugitive components depends upon the vapor pressure of the crude oil. Bakken crude oils are the most volatile of the

[19] Jeff Thompson, Public Crude Assay Websites, February 24, 2011. http://www.coqa-inc.org/docs/default-source/meeting-presentations/20110224_Thompson_Jeff.pdf.

[20] Tesoro Savage, Application for Site Certification Agreement (Vancouver Application), vol. 1, August 29, 2013, Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20I/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%20I.pdf and vol. 2, Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20II%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%20II.pdf.

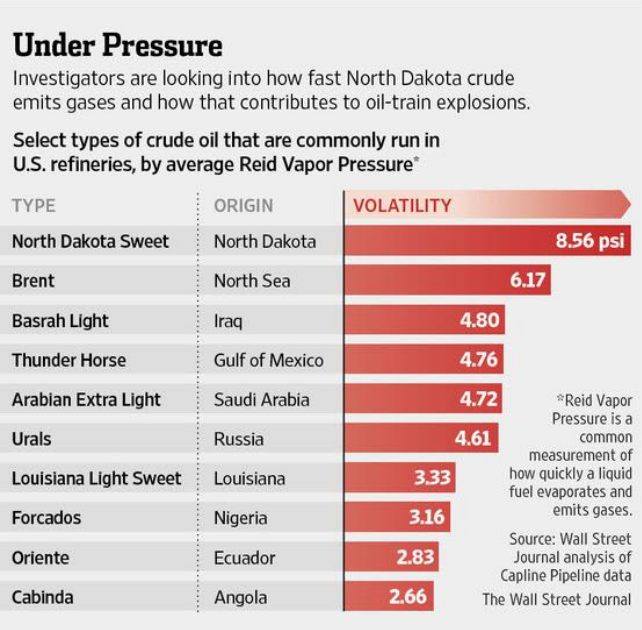
[21] Flammable crude oils will ignite when they are mixed with air in certain concentration ranges. The lowest temperature at which they produce sufficient vapor to support combustion is called the "flash point".

crudes listed in DEIR Table 3-1. Crude oil data collected by Capline Pipeline, which tested crudes from 86 locations world-wide for vapor pressure, found the following:[22]

> "[l]ight, sweet oil from the Bakken Shale had a far higher vapor pressure – making it much more likely to throw off combustible gases – than crude from dozens of other locations… According to the data, oil from North Dakota and the Eagle Ford Shale in Texas had vapor-pressure readings of over 8 pounds per square inch, although Bakken readings reached as high as 9.7 PSI. U.S. refiner Tesoro Corp., a major transporter of Bakken crude to the West Coast, said it regularly has received oil from North Dakota with even more volatile pressure readings – up to 12 PSI. By comparison, Louisiana Light Sweet from the Gulf of Mexico, had vapor pressure of 3.33 PSI, according to the Capline data."

This data, summarized in Figure 1, shows that "light" crude oils vary substantially in vapor pressure and thus would have a wide range of environmental impacts when stored and transported. The more volatile the crude, the higher the ROG, TACs, and methane (a potent greenhouse gas) emissions, the higher the flammability, and the greater the potential consequences in the event of an accident. Thus, the DEIR's assertions that there will be no increase in ROG and TACs as lights will replace lights is simply inaccurate.

Figure 2: Volatility (psi) of Some Commonly Refined Crude Oils

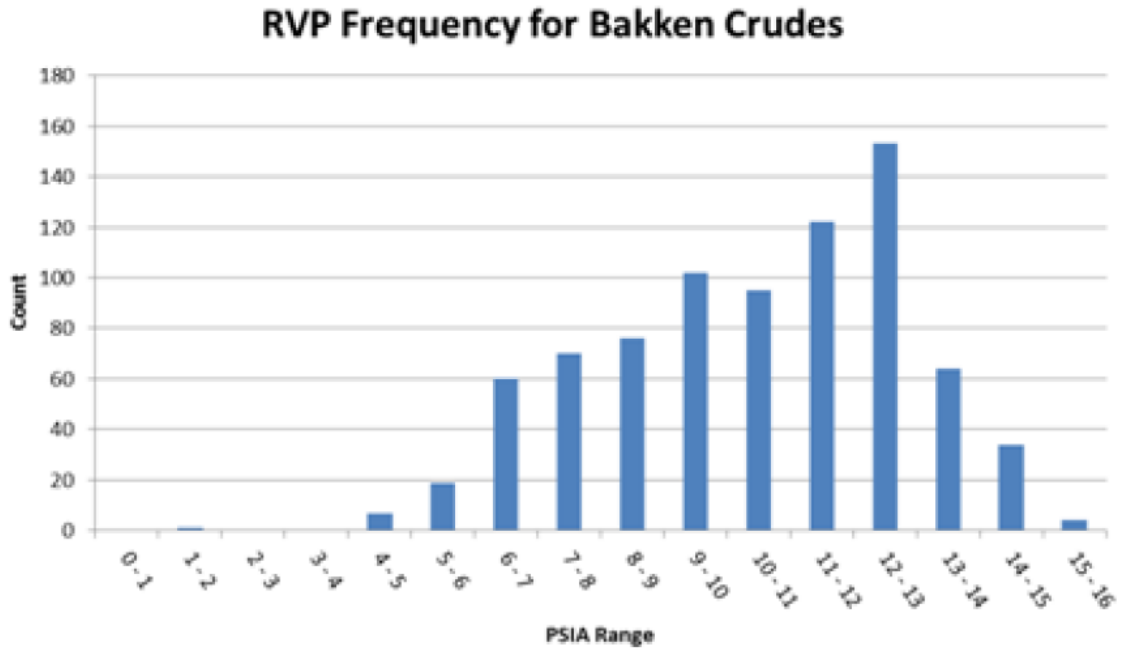


Source: Wall Street Journal, February 23, 2014

[22] Russell Gold, Analysis of Crude From North Dakota Raises Further Questions About Rail Transportation, Wall Street Journal, February 23, 2014.

Other data, summarized by American Fuel & Petrochemical Manufacturers[23] indicate that the RVP of Bakken crude oil can be substantially higher than the value reported based on Capline Pipeline data. A study of Bakken crudes involved in the Lac-Mégantic accident by the Transportation Safety Board of Canada (TSBC) [24] concluded that the volatility and flammability of Bakken crudes were more similar to gasoline than to crude oil, distinguishing Bakken crudes from conventional crude oils.

Figure 3



Source: Dangerous Goods Transport Consulting, Inc., 2014

Bakken and other light crude oils taken straight from the well typically contain large amounts of natural gas liquids (NGLs), known as light ends or condensate. [25] These include C2 to C5 hydrocarbons: methane, propane, butane, ethane, and pentane. These are the components most likely to volatilize, burn, or explode in an accident. These light ends have the effect of increasing a crude's vapor pressure, lowering its flash point and lowering its initial boiling point, all of which result in increased environmental risks. These are called "live" crude oils. The high concentration of light ends makes them highly flammable, more likely to form fire balls and

[23] Dangerous Goods Transport Consulting, Inc., 2014, North Dakota Petroleum Council.

[24] Transportation Safety Board of Canada, TSB Laboratory Report LP148/2013 (TSBC 2013), Available at: http://www.bst-tsb.gc.ca/eng/lab/rail/2013/lp1482013/LP1482013.asp.

[25] Dangerous Goods Transport Consulting, Inc., 2014, https://www.afpm.org/WorkArea/DownloadAsset.aspx?id=4229.

boiling liquid expanding vapor explosions (BLEVES) in accidents. The failure to recognize this resulted in a significant underestimate of ROG and TAC emissions and hazards in the CBR Project DEIR.

In most petroleum-producing regions, light ends are removed before they are shipped using a stabilizer—a tall, cylindrical tower that uses heat to separate the light ends, which are then condensed and sent to a fractionator for processing. Crude stabilizers and NGL pipelines to send the recovered NGLs to market are ubiquitous in oil fields that produce light crude oils as crude pipeline specifications set pressure limits that force stripping of the NGLs. However, in the Bakken fields, this infrastructure is rare and most Bakken crude that is shipped by rail is shipped live. This distinguishes it from other light crudes, which are shipped dry, e.g., Eagle Ford crudes in Texas, where oil field infrastructure exists to process it and most of it is shipped by pipeline, which requires that NGLs be stripped.[26]

Other crudes that Bakken would replace, such as ANS, are hard to ignite because they do not have as much combustible light ends. Most light crudes, including the imported foreign crudes currently processed, are stabilized. These stabilized crudes will not actively boil at ambient temperature and can be more safely shipped, stored, and refined. Thus, while "light" crude may replace other types of "light" crude, there are major differences in composition that affect environmental impacts. The CBR Project DEIR does not impose any condition(s) that require that NGLs be removed from received crudes to mitigate these impacts. Thus, analyses must assume that they will be present.

In addition, Bakken crudes, when blended with heavy crudes to meet crude slate requirements, have resulted in many refinery operating issues, which increase emissions. These include fouling of the cold preheat train; desalter upsets; and fouling of hot preheater exchangers and furnaces; as well as corrosion.[27] These operating problems increase emissions. These operating problems and attendant emission increases were not disclosed in the CBR Project DEIR.

2. Crude Slate Impacts Are Not Part of the Baseline

The DEIR next asserts that "[e]ven if VOC emissions were to increase based on Valero's purchase of light North American crudes, any such emissions increases would properly be considered part of the baseline because the baseline includes the full scope of operations allowed under existing permits that were issued based upon prior CEQA review." DEIR, p. C.2-1.

[26] 'Degassing' North Dakota Crude Oil Before Shipping Among Safety Ideas, Insurance Journal, May 14, 2014, Available at: http://www.insurancejournal.com/news/national/2014/05/14/329095.htm.

[27] Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013, http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html.

Elsewhere, the DEIR asserts, "Finally, even if one assumed that Valero will purchase 70,000 barrels per day of light sweet North American crude, and the crudes delivered and processed became substantially lighter, any resulting increase in emissions would be within the baseline for operational air quality impact." This is supported by citing the same suite of CEQA cases relied on for the parallel argument with respect to heavy sour crudes discussed above. DEIR, p. C.2-2. The response to this argument around heavy sour crudes applies equally here and is incorporated by reference.

The baseline argument for light sweet crudes goes a step further than for heavy sour crudes, arguing that "Valero holds permits for all of the Refinery's process equipment… The City and the BAAQMD issued these permits based on the environmental impact report (EIR) for the Valero Improvement Project (VIP) prepared and certified by the City in 2003. The baseline includes the full scope of operations allowed under these permits. In particular, the baseline includes the permitted operation of the Refinery's eight crude oil storage tanks (storage tanks S-57 through S-62, S-1047, and S-1048). In connection with the VIP, the BAAQMD issued permits based on the City's EIR." DEIR, p. C.2-3.

This mischaracterizes the VIP EIR and the permits for the subject tanks. The VIP EIR evaluated only the two new storage tanks (VIP DEIR, p. 3-51) and the increase in ROG emissions from several other unidentified tanks up to a 5 ton/year increase in ROG relative to a 3-year baseline, based on a vapor pressure of 5 psi.[28] VIP DEIR, Table 4.2-9. The CBR Project would facilitate an additional increase in ROG and TAC emissions from these tanks over the same 3-year baseline, due to an increase in the vapor pressure of the stored crude oils and higher amounts of TACs in the rail-imported crudes. Thus, the VIP EIR did not evaluate the full scope of the ROG and TAC emissions that would occur as a result of the CBR Project.

In addition, the VIP EIR analyzed the TAC emissions from these tanks. These emissions were based on a speciation profile that assumes far less toxic air contaminants than would be present in the crudes listed in the CBR Project. DEIR Table 3-1. For example, the VIP EIR calculations assumed that benzene would be present in the crudes stored in new Tanks 1707 and 1708 at 0.009 weight percent (wt.%).[29] The benzene content of the suite of tar sands crudes listed in DEIR Table 3-1 are substantially higher than 0.009 wt.%, ranging from 0.02 wt.% to

[28] The BAAQMD Permit Handbook in Chapter 3.1 refers to U.S. EPA's AP-42 guidelines, Chapter 5.2, in which a default RVP for crude oil is listed as 5 psi, though it is noted that RVP of crude oils can range from less than 1 up to 10 psi. See: http://hank.baaqmd.gov/pmt/handbook/rev02/PH_00_05_03_01.pdf and http://www.epa.gov/ttnchie1/ap42/.

[29] The benzene concentration assumed in the storage tanks is calculated from post-VIP ROG emissions of 193 ton/yr (VIP DEIR, Table 4.2-9) and the post-VIP benzene emissions of 33.93 lb/yr (VIP DEIR, Table 4.7-6) as: 100x[33.93 lb/yr/(193 ton/yr)(2000 lb/ton)] = 0.009 wt%.

0.81 wt.%,[30] or over 2 to 90 times higher. Similarly, Material Safety Data Sheets (MSDSs) submitted by others seeking to import similar cost-advantaged North American crudes, including Bakken, indicate benzene concentrations up to 7 wt.%,[31] with Bakken crudes generally having the highest concentrations of benzene among all those evaluated. Benzene is a known human carcinogen. Human exposure to benzene has been associated with a range of acute and long-term adverse health effects and diseases, including cancer and adverse hematological, reproductive and development effects.[32]

The CBR Project DEIR incorrectly asserts that "even if the Project were to cause an increase in ROG emissions from storage tanks, any such increase would be considered part of the baseline conditions." DEIR, p. C.2-3. The CEQA baseline is not determined by permit conditions, but rather by actual conditions. The full scope of tank operations, i.e., storing crude oils that have much higher vapor pressures and concentrations of TACs than existed in the market place at the time of the 2002 VIP CEQA review, were never subject to CEQA review and must be evaluated in the instant case.

II. THE DEIR UNDERESTIMATED ROG EMISSIONS

The DEIR estimated that the Project would result in a net decrease in ROG emissions of 1.61 ton/yr, as summarized in Table 1. DEIR, Table 4.1-5.

Table 1: Annual and Daily Net Operational ROG Emissions

Source	**ROG*** (ton/yr)	**ROG**** (lb/day)
Unloading Rack & Pipeline Fugitive Components	1.88	10.30
Locomotives	1.70	9.32
Marine Vessels (Displaced Baseline)	-5.18	-28.38
Total Net Emissions	**-1.61**	**-8.77**

* Source: DEIR Table 4.1-5

** Calculated as (ton/year)(2000 lbs/ton)/(365 days/year)

[30] www.crudemonitor.ca. Concentrations reported in volume % (v/v) in this source were converted to weight % by dividing by the ratio of compound density in kg/m^3 at 25 C (benzene =876.5 kg/m^3) to crude oil density in kg/m^3, based on the most recent sample, as of June 27, 2014.

[31] TSBC 2013; Tesoro Savage, Application for Site Certification Agreement, vol. 2, Appendix G: Material Safety Data Sheets for Enbridge Bakken (n-hexane = 11%); sour heavy crude oil (benzene = 7%; toluene = 7%; ethylbenzene = 7%; xylene = 7%); sweet heavy crude oil (toluene = 7%); light sweet crude oil (benzene = 7%; toluene = 7%; ethylbenzene = 7%; xylene = 7%), August 29, 2013, Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20II%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%20II.pdf.

[32] CARB, Report to the Scientific Review Panel on Benzene, Prepared by the Staffs of The Air Resources Board and The Department of Health Services, November 27, 1984, Available at: http://www.arb.ca.gov/toxics/id/summary/benzene.pdf; Chronic Toxicity Summary: Benzene, Available at: http://www.oehha.org/air/chronic_rels/pdf/71432.pdf; World Health Organization, Exposure to Benzene: A Major Public Health Concern, Available at: http://www.who.int/ipcs/features/benzene.pdf.

The DEIR underestimated ROG emissions as it excluded many sources of ROG emissions from the Project, discussed below. The *increase* in ROG emissions is significant when these omissions are cured.

A. Decrease In Ship Emissions Are Not Real Or Enforceable

The ROG emissions in Table 1 assume marine vessel emissions would be reduced by 5.18 ton/yr, by eliminating 73 vessel trips (70,000 bbl/day x 365 day/350,000 bbl/vessel). DEIR, p. 4.1-16. The DEIR asserts that "[c]rude oil delivered to the Refinery by tank car would not displace crude oil delivered to the Refinery by pipeline." DEIR, p. ES-3, 1-1.

However, it is well known that San Joaquin Valley crude oil production is declining.[33] The nearby Shell Oil Refinery in Martinez, for example, recently increased crude storage capacity to substitute imported crude oil by marine vessel "for diminishing San Joaquin Valley crude by pipeline." DEIR, Table 5-1. ESA expressed concern that ship deliveries could increase in the future to replace diminishing supplies of crude oil available by pipeline. Valero 2013, Data Request No. 2, Item 1.[34] Further, the BAAQMD Statement of Basis for the VIP Project states: "Valero anticipates the possibility that crude may no longer be brought in by pipeline. This could result from a problem with the pipeline, or a change in the cost of crude that makes pipeline supply no longer economical."[35] Thus, it is entirely possible, especially in the absence of any enforceable conditions of approval, that the Project would not decrease marine deliveries to the extent claimed in the DEIR.

The DEIR must be modified to include clearly stated and enforceable provisions to assure that any increase in ROG and TAC emissions from importing crude by rail rather than by marine vessel or pipeline are fully offset by reductions in ship emissions and that the reductions are achieved in practice. These conditions should include requirements to test, record, and report to the City the RVP of all crude oil delivered by ship, rail, and pipeline and source testing of representative ship and locomotive emissions to assure the reductions are achieved.

B. Storage Tanks ROG and TAC Emissions Were Omitted

The DEIR did not adequately quantify emissions from the tanks that would store the crude oil delivered by rail. The emissions from floating-roof tanks include: tank breathing losses

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[33] California Energy Commission, Margaret Sheridan, California Crude Oil Production and Imports, April 2006, Available at: http://www.energy.ca.gov/2006publications/CEC-600-2006-006/CEC-600-2006-006.PDF.

[34] Valero Responses to: Valero Crude by Rail Project Data Request Number 2, April 2, 2013.

[35] http://www.baaqmd.gov/~/media/Files/Engineering/Title%20V%20Permits/B2626/B2626_2010-05_renewal_03.ashx?la=en.

(the sum of rim seal losses, withdrawal losses, deck fitting losses, and deck seam losses estimated by the EPA model TANKS 4.0.9d) and roof landing losses.

1. Significant Tank Breathing Losses Were Omitted

Tank breathing losses are estimated using the EPA model: TANKS 4.0.9d. The CBR Project DEIR did not include any emissions from the tanks that would store the rail-imported crude.

The CBR Project DEIR describes the Project as replacing 70,000 bbl/day of crude oil delivered by ship with 70,000 bbl/day of crude oil delivered by train. The CBR Project DEIR fails to consider what happens to the crude oil after it is transferred from the rail cars through a new pipeline. DEIR, Sec. 3.2. It simply states that the contents of each tank car will be pumped "into storage tankage located in the Refinery's crude oil storage tank field." DEIR, p. 3-20. This crude oil will be stored in existing storage tanks. As the imported crude oil will have a higher vapor pressure than current crude oils stored in these tanks, ROG and TAC emissions from the tanks will increase. The VIP EIR did not evaluate these emission increases. The CBR Project DEIR also does not include these ROG and TAC emissions.

The Project described in the IS/MND included transferring crude oil from rail cars into existing external floating roof tank 1776. This required changing the service of this tank from jet fuel and other refinery products to crude oil. The ROG emissions were estimated with the EPA TANKS 4.0.9d model for a throughput of 70,000 bbl/day and a crude oil RVP of 9.4 psi. The resulting ROG emissions were 39.3 lb/day and 7.18 ton/yr. The net ROG emission increase, relative to December 2009 through November 2012 baseline, was 23.7 lb/day and 4.33 ton/yr. DEIR, Appx. E.3 (2/13 Application, Table 3-2). The supporting calculations for these emission increases (in Appendix B to the February 2013 Application, provided in DEIR, Appx. E.3, Attachments B-1 and B-2) were withheld from the DEIR as confidential business information (CBI).

The Project was modified in November 2013 to replace Tank 1776 with Tanks 1701 through 1708 (S-57 through S-62). These are existing external floating roof tanks that are currently permitted to store crude oil and have historically stored crude oil delivered by both ship and pipeline. DEIR, Appx. E.4 (11/13 Application, p. 6). Thus, the baseline emissions from these tanks include both San Joaquin Valley crudes and ANS and other ship-imported crudes. These tanks are not in the Title V permit for the Valero Refinery, but rather in the Title V Permit for NuStar Logistics, L.P., Facility B5574. The November 2013 Application incorrectly asserts that these tanks are neither altered nor modified sources and thus are not subject to Authority to Construct and New Source Review requirements for the CBR Project. DEIR, Appx. E.4 (11/13 Application, p. 7). The November 2013 Application at p. 7 (DEIR, Appx. E.4) asserts:

> "Changes in material stored. The tanks are currently permitted to store crude oil received by marine vessels and pipeline. With the implementation of this project, the tanks will continue to store crude oil. The crude oil will be received from rail cars, as well as from marine vessels and pipeline. Tanks 1701 through 1706 have historically stored crude oil delivered by ships and pipeline. Tanks 1707 and 1708 were recently constructed and were permitted under NSR to store crude oil. These tanks currently comply with all the requirements in Regulation 8, Rule 5, and associated permit conditions."

Similarly, the DEIR argues (DEIR, p. 4.1-17):

> "Nor would the Project cause any emissions increases from storage tanks. Currently, the Refinery stores crude oil delivered by ship and pipeline in eight existing storage tanks numbered 1701 through 1708. Crude oil delivered by rail would be stored in the same tanks. The tanks would not be modified, and would continue to be subject to the same throughput limit and other permit conditions."

Thus, the DEIR does not include any ROG or TAC emissions from these tanks. However, this assertion is invalid, as explained above. The basis of this argument is that "Valero must blend crude feedstocks to a narrow range of weight and sulfur content before they can be processed into marketable products. Because the crude oil blends cannot become significantly heavier or lighter, nor contain significantly more sulfur, there would be no increase in processing emissions." DEIR, p. 4.1.17. This is immaterial as to ROG and TAC emissions because they do not depend on weight and sulfur content of the crude, but rather on vapor pressure and TAC speciation of the crude. These are not related to the gravity or sulfur content of the crude oil.

The ROG and TAC emissions from the receiving storage tanks would increase if 70,000 bbl/day of ship-imported or pipeline-imported crude were replaced with 70,000 bbl/day of rail-imported crude. The DEIR is deficient for failing to include any estimate of these emission increases and for withholding all information required to estimate these emissions, information that is never classified as CBI in public documents—vapor pressures, tank characteristics, baseline emissions, etc.

An approximate estimate of the increase in daily ROG emissions can be made from the previously reported daily ROG emissions for Tank 1776. The IS/MND estimated daily ROG emissions of 39.3 lb/day for a 70,000 bbl/day throughput of crude with an RVP of 9.4 psi. The RVP of the baseline crude in the seven storage tanks that would be used is unknown. However, the DEIR indicates that it is either San Joaquin Valley crude (pipeline) or Alaska North Slope lookalikes.

First, assuming the baseline crude has an RVP equal to that for Alaska North Slope crude, or 6.3 psi,[36] the baseline ROG emissions for 70,000 bbl/day would be **26.3 lb/day**.[37] The increase in ROG emissions, from storing 70,000 bbl/day of Bakken crude in the same tank(s), assuming the reported upper-bound vapor pressure for Bakken crude (15.5 psi)[38] would be **64.8 lb/day**.[39] Thus, the net increase in ROG emissions from replacing 70,000 bbl/day of ship-imported ANS with 70,000 bbl/day of rail-imported Bakken is **38.5 lb/day** (64.8 - 26.3 = 38.5). The corresponding net increase in annual emissions would be **7.0 ton/year**[40] if all of the rail-imported crude were Bakken. This is a reasonably foreseeable scenario as crudes required to blend 100% Bakken to an ANS-lookalike crude could be imported by marine vessel

Second, assuming the baseline crude has an RVP equal to that of San Joaquin Valley crude or other similar heavy sour crudes, 0.04 psi,[41] the baseline ROG emissions for 70,000 bbl/day would be **0.2 lb/day**.[42] As detailed above, the increase in ROG emissions, from storing 70,000 bbl/day of Bakken crude in the same tank(s), assuming the reported upper-bound vapor pressure for Bakken crude (15.5 psi)[43] would be **64.8 lb/day**.[44] Thus, the net increase in ROG emissions from replacing 70,000 bbl/day of pipeline-imported San Joaquin Valley or other similar heavy sour crudes with 70,000 bbl/day of rail-imported Bakken is **64.6 lb/day** (64.8 - 0.2 = 64.6). The corresponding net increase in annual emissions would be **11.8 ton/year** if all of the rail-imported crude were Bakken. This is a reasonably foreseeable scenario as crudes required to blend 100% Bakken to an ANS-lookalike could be imported by marine vessel.

The resulting daily net increase in ROG emissions for a San Joaquin Valley or other similar heavy crude baseline, but otherwise assuming all of the CBR Project DEIR's emissions, is 56 lb/day, as shown in Table 2. This increase in ROG emissions is significant, as it exceeds

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[36] ExxonMobil Refining and Supply Company, ANS11U, Available at: http://www.exxonmobil.com/crudeoil/about_crudes_ans.aspx and http://www.exxonmobil.com/crudeoil/download/ans11u.pdf.

[37] Baseline ROG emissions from storage of 70,000 bbl/day of ANS in one or more of existing tanks 1701 - 1708 = (39.3 lb/day) (6.3 psi/9.4 psi) = **26.3 lb/day**.

[38] Classification and Hazard Communication Provisions for Crude Oil – Bakken Crude Oil Data, June 13, 2014.

[39] Increase in POC emissions from storing 70,000 bbl/day of Bakken crude in one or more of existing tanks 1701-1708 = (39.3 lb/day)(15.5 psi/9.4 psi) = **64.8 lb/day.**

[40] Increase in annual emissions = (38.5 lb/day)(365 days/year)/(2000 lb/ton) = **7.02 ton/yr.**

[41] Emission Calculation Protocol for Oil Production Tanks, September 1, 2000.

[42] Baseline ROG emissions from storage of 70,000 bbl/day of ANS in one or more of existing tanks 1701 - 1708 = (39.3 lb/day) (0.04 psi/9.4 psi) = **0.17 lb/day**.

[43] Classification and Hazard Communication Provisions for Crude Oil – Bakken Crude Oil Data, June 13, 2014.

[44] Increase in ROG emissions from storing 70,000 bbl/day of Bakken crude in one or more of existing tanks 1701 - 1708 = (39.3 lb/day)(15.5 psi/9.4 psi) = **64.8 lb/day.**

the BAAQMD CEQA significance threshold[45] of 54 lb/day and triggers New Source Review thresholds that require Best Available Control Technology. This is a significant impact that was not disclosed in the DEIR. The total Project increase would be even greater than the emissions in Table 2, which do not include ROG increases from other omitted sources, discussed below.

Table 2: Revised Annual and Daily Net Operational ROG Emissions
San Joaquin Valley Crude Baseline

Source	**ROG** (ton/year)	**ROG** (lb/day)
Unloading Rack & Pipeline Fugitive Components	1.88	10.30
Locomotives	1.70	9.32
Storage Tank (SJV Crude Baseline)	***11.79***	***64.60***
Marine Vessels (Displaced Baseline)	-5.18	-28.38
Total Net Emissions	**10.19**	**55.83**
BAAQMD CEQA Significance Threshold	10	54
Significant?	**YES**	**YES**

The increase in ROG emissions in Table 2 would be accompanied by an increase in TAC emissions, which are estimated by multiplying the ROG emission increase by the weight percent of each TAC in the ROG emissions (i.e., the TAC speciation profile). The contribution of TAC emissions from these tanks were not included in the DEIR's health risk assessment, which only evaluated diesel particulate matter and PM2.5.

Because the Project would result in significant ROG emissions, the lead agency is required to examine the impact of the increase in localized ROG emissions on ambient air quality and the local community and identify mitigation that is capable of reducing or eliminating these impacts to below a level of significance. To mitigate the Project's significant ROG emissions, the City should consider feasible mitigation measures such as the use of zero-leak fugitive components; use of geodesic domes on external floating roof tanks, which are commonly used on tanks that store RVP 11 crude oils; cable-suspended, full-contact floating roofs; and the use geodesic domes on the existing fixed roof tanks.[46]

[45] BAAQMD Proposed Air Quality CEQA Thresholds of Significance, May 3, 2010, Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Summary_Table_Proposed_BAAQMD_CEQA_Thresholds_May_3_2010.ashx?la=en.

[46] See, e.g., Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project, September 6, 2013, Draft Negative Declaration (Carson Neg. Dec.), Available at: https://www.aqmd.gov/CEQA/documents/2013/nonaqmd/Draft_ND_Phillips_66_Crude_Storage.pdf and City of Richmond, Chevron Refinery Modernization Project DEIR (Chevron DEIR), Chapter 4.3, pp. 4.3-92, Available at: http://chevronmodernization.com/wp-content/uploads/2014/03/4.3_Air-Quality.pdf.

2. Roof Landing, Degassing, and Cleaning Emissions Were Omitted

The increase in ROG emissions estimated above is based on an adjustment of a calculation in the IS/MND based on EPA's TANKS 4.0.9d model (TANKS). However, this model only estimates rim seal losses, withdrawal losses, deck fitting losses, and deck seam losses. It does not estimate roof landing losses, inspection losses, or flashing losses. Thus, it underestimated tank emissions. Therefore, the above estimate of the increase in ROG emissions in Table 2 is an underestimate. These additional emissions should be estimated, added to other tank emissions, and mitigated when the DEIR is revised.

The Project involves seven existing external floating roof tanks configured to comply with BAAQMD Regulation 8-5. DEIR, p. 3-5. These tanks are pontoon-type tanks. DEIR, Appx. E.4 (2/13 Application, p. 1-8). Pontoon tank roofs are supported on legs. In floating roof tanks with leg-supported roofs, the roof floats on the surface of the liquid inside the tank and reduces evaporative losses during normal operations. However, when the tank is emptied, the roof sits on the legs and is essentially uncontrolled.

The EPA has explained that the TANKS model does not include roof landings, and recommended that they be estimated with the equations in AP-42. In other words, the EPA TANKS model estimates evaporative emissions for normal operations only, *i.e.*, it assumes that the floating tank roof is always floating.[47] However, when a tank is emptied to the point that the roof no longer floats on the liquid but lands on deck legs, evaporative losses occur.

> After the floating roof is landed and the liquid level in the tank continues to drop, a vacuum is created which could cause the floating roof to collapse. To prevent damage and to equalize the pressure, a breather vent is actuated. Then, a vapor space is formed between the floating roof and the liquid. The breather vent remains open until the roof is again floated, so whenever the roof is landed, vapor can be lost through this vent.[48]

These losses are called "roof landing losses."

In addition, "degassing and cleaning losses" occur when tanks are drained and degassed for inspection and/or cleaning. These include both roof landing emissions, complete tank

[47] EPA, TANKS Software Frequent Questions, Updated February 2010, Available at: http://www.epa.gov/ttnchie1/faq/tanksfaq.html. ("How can I estimate emissions from roof landing losses in the tanks program? … In November 2006, Section 7.1 of AP42 was updated with subsection 7.1.3.2.2 Roof Landings. The TANKS program has not been updated with these new algorithms for internal floating roof tanks. It is based on the 1997 version of section 7.1.").

[48] EPA, AP-42, Chapter 7.1 Organic Liquid Storage Tanks, November 2006, Available at: http://www.epa.gov/ttn/chief/ap42/ch07/final/c07s01.pdf.

degassing, and emissions from cleaning out accumulated sludge. These emissions are essentially uncontrolled tank emissions.[49]

The tank cleaning emissions could be substantially higher for Bakken crudes than for other types of crude. Bakken crudes leave waxy deposits in pipelines and tanks, which require more frequent cleaning,[50] and thus higher emissions, than the crudes they would replace. Environmental impacts from chemical dispersants used to control these waxy deposits in tanks and pipelines also should be evaluated.

The EPA recommends methods to estimate emissions from degassing and cleaning and roof landing losses.[51] The method for estimating emissions depends on the construction of the tank, *e.g.*, the flatness of the tank bottom and the position of the withdrawal line (the so-called liquid "heel"). Degassing, cleaning, and roof landing losses continue until the tank is refilled to a sufficient level to again float the tank roof. Total ROG emissions from floating roof tanks during a roof landing is the sum of standing idle losses and filling losses. They can be estimated using formulas contained in EPA's *Compilation of Air Pollutant Emission Factors* ("AP-42"), Chapter 7.1, Organic Liquid Storage Tanks, Section 7.1.3.2.2. These emissions are routinely included in emission inventories. They are required to be reported, for example, in Texas.[52] They are also included in the emission inventory for Tesoro's Vancouver Terminal, which imports similar crudes by rail, and stores them in tanks.[53]

To reduce emissions from tank breathing losses (Comment II.B.1), degassing, cleaning and roof landing losses, the City should require the Applicant to install geodesic domes on the tanks that would store rail-imported crudes, thus avoiding emissions from these and other tank sources.

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[49] See EPA guidance on estimating these emissions at: http://www.epa.gov/ttnchie1/faq/tanksfaq.html#13 .

[50] Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013, Available at: http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html.

[51] "How Can I Estimate Emissions from Degassing and Cleaning Operation During a Tank Turnaround? And How Can I Estimate Emissions from Roof Landing Losses in the TANKS Program:?", Available at: http://www.epa.gov/ttnchie1/faq/tanksfaq.html#13 .

[52] Memorandum from Dan Eden, Deputy Director, Office of Permitting, Remediation, and Registration; David C. Schanbacher, Chief Engineer; and John Steib, Deputy Director, Office of Compliance and Enforcement, Re: Air Emissions During Tank Floating Roof Landings, December 5, 2006, Available at: http://www.tceq.state.tx.us/assets/public/permitting/air/memos/tank_landing_final.pdf .

[53] Tesoro Savage, Application for Site Certification Agreement, Section 5.1.2.1.4, Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20I/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%20I.pdf .

Over 10,000 aluminum domes have been installed on petrochemical storage tanks in the United States.[54] The ExxonMobil Torrance Refinery: "completed the process of covering all floating roof tanks with geodesic domes to reduce volatile organic compound (VOCs) emissions from facility storage tanks in 2008. By installing domes on our storage tanks, we've reduced our VOC emissions from these tanks by 80 percent. These domes, installed on tanks that are used to store gasoline and other similar petroleum-derived materials, help reduce VOC emissions by blocking much of the wind that constantly flows across the tank roofs, thus decreasing evaporation from these tanks."[55]

A crude storage project, recently proposed at the Phillips 66 Los Angeles Carson Refinery, required external floating roof tanks with geodesic domes to store crude oil with an RVP of 11.[56] Carson Neg. Dec. Table 1-1. The ConocoPhillips Wilmington Refinery added a geodesic dome to an existing oil storage tank to satisfy BACT.[57] Similarly, Chevron proposes[58] to use domes on several existing tanks to mitigate VOC emission increases at its Richmond Refinery.[59] The U.S. Department of Justice CITGO Consent Decree required a geodesic dome on a gasoline storage tank at the Lamont, Texas refinery.[60] Further, numerous vendors have provided geodesic domes for refinery tanks.[61] The crudes that would be stored in the Project tanks have vapor pressures that are comparable to gasoline (TSBC 2013, Sec. 3.2.7), justifying the use of geodesic domes to control tank emissions.

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[54] M. Doxey and M. Trinidad, Aluminum Geodesic Dome Roof for Both New and Tank Retrofit Projects, Materials Forum, v. 30, 2006, Available at: http://www.materialsaustralia.com.au/lib/pdf/Mats.%20Forum%20page%20164_169.pdf.

[55] Torrance Refinery: An Overview of our Environmental and Social Programs, 2010, Available at: http://www.exxonmobil.com/NA-English/Files/About_Where_Ref_TorranceReport.pdf.

[56] See, e.g., Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project, September 6, 2013, Table 1-1, Draft Negative Declaration, Available at: https://www.aqmd.gov/CEQA/documents/2013/nonaqmd/Draft_ND_Phillips_66_Crude_Storage.pdf.

[57] SCAQMD Letter to G. Rios, December 4, 2009, Available at: http://yosemite.epa.gov/r9/air/epss.nsf/e0c49a10c792e06f8825657e007654a3/e97e6a905737c9bd882576cd0064b56a/$FILE/ATTTOA6X.pdf/ID%20800363%20ConocoPhillips%20Wilmington%20-%20EPA%20Cover%20Letter%20%20-AN%20501727%20501735%20457557.pdf.

[58] City of Richmond, Chevron Refinery Modernization Project, Environmental Impact Report, Volume 1: Draft EIR, March 2014 (Chevron DEIR), Available at: http://chevronmodernization.com/project-documents/ .

[59] Chevron DEIR, Chapter 4.3.

[60] CITGO Petroleum Corp. Clean Air Act Settlement, Available at: http://www2.epa.gov/enforcement/citgo-petroleum-corporation-clean-air-act-settlement.

[61] See, e.g., Aluminum Geodesic Dome, Available at: http://tankaluminumcover.com/Aluminum-Geodesic-Dome; Larco Storage Tank Equipments, Available at: http://www.larco.fr/aluminum_domes.html; Vacono Dome, Available at: http://www.easyfairs.com/uploads/tx_ef/VACONODOME_2014.pdf; United Industries Group, Inc., Available at: http://www.thomasnet.com/productsearch/item/10039789-13068-1008-1008/united-industries-group-inc/geodesic-aluminum-dome-roofs/.

3. Tank Flashing Emissions Were Omitted

Most Bakken crudes are transported raw, without stabilization, due to the lack of facilities in the oil fields, as discussed elsewhere in these Comments. Unstabilized or "live" crude oils have high concentrations of volatile materials entrained in the bulk crude oil. Tank flashing emissions occur when these crude oils, such as Bakken, are exposed to temperature increases or pressure drops. When this occurs, some of the compounds that are liquids at the initial pressure/temperature transform into gases and are released or "flashed" from the liquid. These emissions are in addition to working and breathing emissions from tanks and are not estimated by the EPA TANKS 4.0.9d model. These emissions can be calculated using standard procedures.[62] The DEIR did not mention or calculate these emissions, nor does it include permit conditions that would allow only stabilized crude oils to be received.

4. Water Draw Tank Emissions Were Omitted

Crude oil typically contains small amounts of water, which is separated from the crude oil and accumulates in the bottom of storage tanks. This accumulated water, referred to as water draw, is typically transferred from the crude oil storage tanks into a smaller water draw surge tank for processing prior to disposal. Over time, a thick layer of crude oil forms in the water draw surge tank. The water draw surge tank and processing of wastewaters from it emit ROG and TACs. The DEIR does not mention water draw, or include emissions from storing or processing it, which would increase as the vapor pressure of the stored crude increases, i.e., as from a switch from San Joaquin Valley to Bakken crude.

C. Rail Car Unloading Emissions Were Omitted

The Project includes a rail car unloading rack capable of unloading two parallel rows of 25 crude oil rail cars simultaneously. DEIR, p. ES-3. The DEIR does not disclose any emissions from the unloading process, while EIRs for other similar facilities such as the proposed Phillips 66 CBR Project in Santa Maria, report unloading emissions.[63]

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[62] See, e.g., calculation methods at: Paul Peacock, Marathon, Bakken Oil Storage Tank Emission Models, March 23, 2010; TCEQ, Air Permit Reference Guide APDG 5941, Available at: http://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/guidance_flashemission.pdf; Kansas Dept. of Health & Environment, Available at: http://www.kdheks.gov/bar/download/Calculation_Flashing_Losses_Handout.pdf; B. Gidney and S. Pena, Upstream Oil and Gas Storage Tank Project Flash Emissions Models Evaluation, July 16, 2009, Available at: http://www.bdlaw.com/assets/htmldocuments/TCEQ%20Final%20Report%20Oil%20Gas%20Storage%20Tank%20Project.pdf .

[63] Marine Research Specialists (MRS), Phillips 66 Company Rail Spur Extension Project Public Draft Environmental Impact Report and Vertical Coastal Access Assessment, November 2013; p. 2-14, Available at: http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/Draft+EIR-Phillips+66+Rail+Spur+Extension+Project+(November+2013)/Full+EIR+-+Large+File/p66.pdf.

At Valero, each side of the rack would have 25 unloading stations, which would "bottom-unload" closed-dome tank cars using 4-inch-diameter hoses, with dry disconnect couplings that would connect to a common header between the two sides of the rack (a check valve, connected to the top of each tank car via 2-inch-diameter hose would open to allow ambient air to enter during unloading and immediately close when unloading is finished). DEIR, p. 3-2.

A check valve would be installed onto each vent valve on the top of each tank car. The vent valve on the top of each tank car would be opened and the accompanying check valve would only allow fresh air into each tank car, and would prevent release of hydrocarbon fugitive emissions to the atmosphere. At each end car and on approximately every 8 tank cars in the 25 tank car string, a hose would be connected from the tank car's vent connection to a separate "equalization header." The equalization header would ensure the vapor spaces above the stored liquid crude in the tank cars is equalized between the tank cars. Individual drain hoses would be manually connected to the bottom of each tank car by on-site workers. The contents of each tank car would be drained by gravity into a collection pipe (collection header) and then pumped directly into storage tanks. DEIR, p. 3-21.

A typical rail car unloading system is described differently in the Santa Maria Rail DEIR. Santa Maria DEIR, p. 2-14. In that DEIR, the rail car unloading system consists of an adapter unit that connects the rail car to couplings, hoses, valves and piping that connect to a positive displacement pump. Air and crude oil vapors are commonly mixed in with crude oil, from loading and evaporation during transit. These vapors can present an explosion risk for downstream equipment and are typically removed with air eliminators. As the vapors contain high concentrations of ROG and TACs, they are typically routed to carbon columns or an incinerator to control the emissions.

The Valero CBR Project DEIR does not mention these vapors, an air eliminator, or indicate how they will be controlled. The Valero CBR Project DEIR only notes that "the BAAQMD will consider locomotive emissions and tank car unloading emissions as may be caused by the Project." DEIR, p. 3-2. This is not adequate. If unloading emissions will occur, at an air eliminator or other release point, the DEIR should be modified to describe them and to quantify them. If they are not present, the DEIR should explain how the explosion hazard typically associated with unloading cargos such as Bakken crude will be addressed as it is not clear that the air equalization system would eliminate this hazard.

D. Sump Emissions Were Omitted

The unloading facility includes a liquid spill containment sump with the capacity to contain the contents of at least one tank car. DEIR, p. ES-2. Crude oil that spills into this sump

would release vapors including ROG and TAC emissions. The DEIR did not include these emissions.

E. Rail Car Fugitive Emissions Were Omitted

ROG and TACs will be emitted from rail cars from their point of origin through unloading as rail cars are not vapor tight. The DEIR did not include these emissions.

The crude oil would be shipped in tank cars, such that the volume of loaded crude oil shipped is less than the capacity of the rail car to accommodate expansion during shipping. This volume reduction creates free space at the top of the tank car, which provides space for entrained gases to be released from the crude oil[64] and emitted to the atmosphere during transit and idling in rail yards.[65]

As rail cars are not vapor tight, these vapors in the head space above the oil are emitted to the atmosphere during rail transport and at the unloading terminal. Further, most Bakken crudes are shipped live as discussed earlier. These crudes will flash in the tank cars when exposed to temperature increases or pressure drops, causing valves to open, emitting ROG and TACs.

These losses are consistent with the well-known "crude shrinkage" issue associated with crude by rail. The crude delivered is significantly less than the crude loaded. The reported range in crude shrinkage is 0.5% to 3% of the loaded crude.[66] Some of this shrinkage is likely due to emissions from the rail car during transit. The emissions of ROG and TACs from rail cars has been confirmed by field measurements.[67] The DEIR did not include these ROG and TAC emissions in its emission calculations or the health risk assessment.

Tank cars have domes to allow space for the product to expand as temperatures rise. Each dome has a manhole through which the tank car can be loaded, unloaded, inspected, cleaned, and repaired. Dome covers may be hinged and bolted on or screwed on. Most domes

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[64] Anthony Andrews, Congressional Research Service, Crude Oil Properties Relevant to Rail Transport Safety: In Brief, February 18, 2014, pp. 8-9.

[65] A DOT 111 (or comparable) tank car generally has a capacity of 34,500 gallons or 263,000 lbs. gross weight on rail. Under some conditions, the maximum gross weight can be increased to 286,000 lbs. At an API gravity of 50°, a tank car can hold its maximum volume of 31,800 gallons and not exceed the 286,000 lb gross weight on rail limit. As the API gravity drops, the amount of oil that can be carried must also drop. Thus, a tank car of Bakken crude, at its highest density of 39.7° API, can only hold 30,488 gallons, a volume reduction of about 1,300 gallons. Further, as crude oil density (and thus API gravity) is temperature dependent, volume will increase as temperature increases. Thus, the shipper may have to reduce the shipped volume even further. This volume reduction creates a space above the crude oil where vapors accumulate.

[66] Alan Mazaud, Exergy Resources, Pennsylvania Rail Freight Seminar, May 23, 2013, p. 17. Available at: http://www.parailseminar.com/site/Portals/3/docs/Alan%20Mazaud%20Presentation%20-%20AM.pptx

[67] http://www.youtube.com/watch?v=35uC1gLctnw.

have vents and safety valves to let out vapors.[68] Thus, they are sources of ROG emissions that were omitted from the emission calculations. Further, when dome covers are left open, any residual vapors escape to atmosphere. Residual material clings to the bottom and sides of empty rail cars and emits ROG and TAC while the rail cars idle at the site, waiting for the entire unit train to be unloaded. Open covers are common in railyards as they are opened for inspections and repairs. The ROG and TAC emissions from these sources were omitted from the DEIR's emission inventory.

Further, each tank car has a bottom outlet which is used for loading and unloading that includes pumps, manifolds, and valves, all of which leak ROG and TACs. Finally, liquid leaks occur when unloading arms are disconnected, even for the so-called no leak arms proposed for the Project. These disconnect leaks evaporate, contributing to ROG and TAC emissions.

An estimate of these emissions can be based conservatively on the lower end of the range of crude shrinkage (0.5%) discussed above and the maximum freight weight per car of 106 tons from the TRN Spec Sheet-1. DEIR, Appx. E.6 (6/11/14 Memo to Morgan from Velzy, pdf 1208). Assuming 50 cars/train and two unit trains per day, a total of 53 ton/day[69] of ROG can be emitted as the trains traverse the 1500 miles between the shipping point and the Valero rail terminal. Of these 1500 miles, 263 miles are within California.[70] DEIR, Appx. E.5 (Air Quality & GHG Supplement, pdf 1198). Thus, 9.3 ton/day of ROG (18,600 lb/day) can be emitted within California from rail car leakage.[71] Of the 263 miles within California, 22 miles are within the boundary of the BAAQMD. *Ibid.* Thus, 0.8 ton/day (1,555 lb/day) of ROG emissions can be emitted within the BAAQMD.[72] These daily emissions greatly exceed the BAAQMD daily CEQA significance threshold for ROG of 54 lb/day, requiring mitigation.

Additional ROG would be emitted at the Valero railyard, while railcars wait for the entire train to be unloaded, and from the emptied railcars, enroute to the cleaning facility, from residual product that clings to the bottom and sides of the railcars.

These ROG emissions contain the same chemicals found in the crude oil, including benzene, toluene, xylene, hexane, and ethylbenzene. As discussed below, some crudes can contain up to 7% benzene by weight. See Table 3 below. Thus, greater than 1,301 lb/day of benzene could be emitted in California and greater than 109 lb/day of benzene within the

[68] Chapter 11. Tank Car Operations, Available at: http://www.globalsecurity.org/military/library/policy/army/fm/10-67-1/CHAP11.HTML.

[69] ROG emissions from train transit = (106 ton/car)(50 car/train)(2 train/day)(0.005) = **53 ton/day.**

[70] Distance within California = (136+390)/2 = 263 mi.

[71] ROG emitted within California = (318 ton/day)(263/1500) = **9.3 ton/day.**

[72] ROG emitted within BAAQMD = (318 ton/day)(22/1500) = **0.8 ton/day.**

BAAQMD from rail car leakage. This rail car leakage is much greater than the amount of benzene (and other TACs) included in the HRA. For example, the HRA included only 0.06 lb/day of benzene[73] from fugitive components (DEIR, Appx. E.4, pdf 1160) or a tiny fraction of the 109 lb/day of benzene that could be emitted within the BAAQMD from the rail cars themselves.

These are huge emissions, greatly exceeding the ROG (and HRA) CEQA significance thresholds of the BAAQMD and other air district along the rail route. See DEIR, Tables 4.1-5 and 4.1-6. The City must require mitigation for these ROG and TAC emissions.

III. THE DEIR FAILS TO DISCLOSE AND UNDERESTIMATES TAC EMISSIONS USED IN HEALTH RISK ASSESSMENT

Health Risk Assessments (HRAs) typically contain tables that summarize the amount of each TAC and the corresponding cancer, chronic, and acute health risk due to each. The supporting TAC emission calculations are presented in an appendix. The modelling files are separately attached. The HRA in this DEIR does not include most of this information. (Modelling files are available on a CD, which must be requested.) The supporting emission calculations are incomplete and scattered throughout many appendices with no road map explaining how it all fits together, with many analyses superseded.

There is no evident basis for concluding the Project would not result in a significant health impacts as the results are simply stated without the supporting emission calculations, leaving the reader the chore of digging through thousands of pages of appendices to make guesses at the TAC emissions included in the HRA analysis.

My analysis of this material indicates that the HRA only included diesel particulate matter and PM2.5 emissions from locomotives and TAC emissions from fugitive sources, a comparatively minor source of TAC emissions. The TAC emissions from all other sources (storage tanks, idling rail cars) discussed in Comment II were excluded. The TAC emissions from fugitive sources were underestimated, as explained below.

The unloaded crude oil will be transported from the unloading rack to existing crude supply piping in a 4,000–foot-long pipeline. DEIR, p. 1-2. The connecting system includes 3 pumps, 521 valves, 940 flanges, 295 connectors, and 6 pressure relief valves (plus a 15% contingency for valves, flanges and connectors). DEIR, Appx. E.4-1 (11/13 Application, pdf 1179). Crude oil vapors will be emitted from all of these components. The DEIR estimated TAC emissions from these components by first estimating ROG emissions using CARB

[73] Benzene in fugitive emissions from Ex. E.4, Table 3-5: (2.57E-3 lb/hr)(24 hr/day)/(2000 lb/ton) = **3.1E-5 ton/day.**

emissions factors. The ROG emissions were then multiplied by the weight percent of each TAC in the crude.

The TAC emissions from fugitive components were estimated using the "default speciation profile" for crude oil from the EPA program, TANKS4.09.[74] DEIR, Appx. E.4-1 (11/13 Application, pdf 1179, footnote). A "speciation profile" for a petroleum product identifies each chemical in the liquid and its concentration, reported as volume or weight percent. The default speciation profile used in the DEIR is not representative of the crude oil(s) that could be imported at the rail terminal and is entirely hypothetical. DEIR, Table 3-1. The conclusion that the hypothetical speciation profile is appropriate to evaluate Project health impacts is unsupported.

My review of the HRA speciation profile indicates that it is not based on the maximum amount of each TAC found in the crude oils that could be stored in the tanks. Material Safety Data Sheets (MSDSs) submitted in other applications to import cost-advantaged North American crudes[75] indicate that much higher concentrations of TACs could be present in the crude oils unloaded at the Valero Rail Terminal.

The upper bound values from these MSDSs are summarized in Table 3 and compared with the speciation profile used in the DEIR. This table shows that the HRA significantly underestimated all of the organic TACs included in the HRA. Similar information for diesel particulate matter, the only other TAC included in the HRA, is not available in the documents I reviewed.

[74] Crude oil component speciation data was obtained by using the TANKS409d model available at http://www.epa.gov/ttnchie1/software/tanks/ using the database interface to export the speciation profile for the TANKS default crude oil, *viz.*, "Data --> Speciation Profiles --> Export" menu selection and choosing crude oil. This spreadsheet confirms that the default benzene level for crude oils is 0.6 wt.%.

[75] Tesoro Application to SCAQMD for Tank 80079 Throughput Increase, October 3, 2013, PRN 556835 (10/3/13 Application), MSDS for Light Sweet Crude, pdf 12; Tesoro Savage, Application for Site Certification Agreement, vol. 2, Appendix G: Material Safety Data Sheets, August 29, 2013, Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20II%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%20II.pdf.

Table 3: Comparison of DEIR Draft EIR, Appx. E.4, Table 3-5, HRA Speciation Profile for Fugitive Emissions with Maxima Reported in MSDS(s)[76]

TAC	Weight Percent		
	HRA Speciation Profile[77]	Maxima MSDS	Factor Difference
Benzene	0.6	7	11.7
Ethyl Benzene	0.4	7	17.5
Hexane	0.4	11	27.5
Toluene	1	7	7.0
Xylenes	1.4	7	5.0

Table 3 shows that the risk assessment underestimated the amount of benzene, ethyl benzene, hexane, toluene and xylenes in emissions by factors of 5 (xylenes) to 28 (hexane). Actual TAC emissions, after adjusting for the speciation profile, would be much higher as the DEIR excluded most of the sources of ROG emissions that would contribute TACs. The increase in benzene alone is large enough to increase the cancer risk at the maximum exposed individual worker (MEIW) over the BAAQMD Regulation 2-5 significance threshold of 1 in one million. DEIR, Appx. E.4-1 (11/13 Application, pdf 1189).

The DEIR argues that the benzene content of two Canadian crudes are on average lower than the benzene content of Alaska North Slope crude (0.33%), the design crude for the refinery. DEIR, Appx. K, p. K-17. However, the benzene content of other crudes listed in DEIR Table 3-1 are on average much higher than ANS. Light crudes, like Bakken, have been reported to contain benzene concentrations of up to 7 weight %, or twenty-one times more than the design ANS crude.

In sum, the DEIR fails to properly analyze the health impacts of importing, storing, and refining the crude oil that the CBR Project will likely bring to Valero.

[76] Tesoro Savage, Application for Site Certification Agreement, vol. 2, Appendix G: Material Safety Data Sheets for Enbridge Bakken (n-hexane = 11%); sour heavy crude oil (benzene = 7%; toluene = 7%; ethylbenzene = 7%; xylene = 7%); sweet heavy crude oil (toluene = 7%); light sweet crude oil (benzene = 7%; toluene = 7%; ethylbenzene = 7%; xylene = 7%), August 29, 2013, Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20II%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%20II.pdf. See also 3/7/13 Revised Application, pdf 96-115.

[77] DEIR, Appx. E.4, Table 3-5, pdf 1160.

Comments

on

Revised Draft Environmental Impact Report

for the

Phillips 66
Rail Spur Extension
and Crude Unloading Project

Santa Maria, California

Prepared

for

Communities for a Better Environment
Sierra Club
ForestEthics
Center for Biological Diversity

November 24, 2014

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I. INTRODUCTION

The Phillips 66 Santa Maria Refinery (SMR), located in San Louis Obispo County, is proposing to modify an existing rail spur to accommodate train delivery of cost-advantaged crude oils, to replace local supplies. The proposed tracks and unloading facilities would be designed to accommodate unit trains of up to five unit trains per week, consisting of 80 tank cars and associated locomotives and other supporting cars as well as periodic manifest trains of fewer cars not dedicated to SMR oil (Project). I was asked by Communities for a Better Environment (CBE), the Sierra Club, ForestEthics, and the Center for Biological Diversity to review the Revised Draft Environmental Impact Report (RDEIR or Santa Maria RDEIR)[1] and prepare comments on a limited number of issues. This RDEIR replaces a former Draft Environmental Impact Report on a similar Project (DEIR)[2] issued in November 2013 that I also commented on.

My evaluation, presented below, indicates the RDEIR fails to disclose the link between the Rail Spur Project and three other directly related projects: (1) the Propane Recovery Project at Phillips 66's Rodeo facility; (2) the Rodeo Refinery Marine Terminal Offload Limit Revision Project; and (3) the Throughput Increase Project at the Santa Maria Refinery. The impacts of these directly related projects should have been evaluated as a single project. Together, they result in many significant impacts that were not disclosed in the Rail Spur Project RDEIR.

The RDEIR fails to evaluate the impacts resulting from a significant switch in crude slate, from locally sourced heavy crudes to tar sands crudes. The entire Project, comprising the four piecemealed projects, would result in significant unmitigated air quality, global warming, water supply, biological, and corrosion-caused risk of upset and other impacts, either not disclosed, improperly analyzed, or not mitigated in the RDEIR.

Finally, the RDEIR's hazard analysis fails to include the portions of the route where train accidents are most likely to occur due to steep grades and poor condition of tracks and bridges – from the stateline to the rail yards in Roseville and Colton, fails to analyze a worst case spill, and fails to disclose the significant difficulty of cleaning up a tar sands spill to waterways. The railroad tracks in these omitted areas parallel the water supply for most of California. A derailment that spilled significant amounts of tar sands crudes in these waterways could shut down the water supply for most of the state, resulting in significant unmitigated impacts on agricultural and municipal water supplies and significant aquatic biological impacts.

My resume is included in Exhibit 1 to these comments. I have over 40 years of experience in the field of environmental engineering, including air emissions and air pollution

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[1] San Luis Obispo County, Phillips 66 Company Rail Spur Extension and Crude Unloading Project Revised Public Draft Environmental Impact Report and Vertical Coastal Access Project Assessment, October 2014, SCH # 2013071028; Available at: http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/Phillips+66+Company+Rail+Spur+Extension+Project+(Oct+2014)/Phillips+SMR+Rail+Project+Public+Draft+EIR.pdf.

[2] Marine Research Specialists (MRS), Phillips 66 Company Rail Spur Extension Project Public Draft Environmental Impact Report and Vertical Coastal Access Assessment, November 2013.

control; greenhouse gas emission inventory and control; air quality management; water quality and water supply investigations; hazardous waste investigations; hazard investigations; risk of upset modeling; environmental permitting; nuisance investigations (odor, noise); environmental impact reports/statements, including California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documentation; risk assessments; and litigation support.

I have M.S. and Ph.D. degrees in environmental engineering from the University of California at Berkeley with minors in Hydrology and Mathematics. I am a licensed professional engineer (chemical, environmental) in five states, including California; a Board Certified Environmental Engineer, certified in Air Pollution Control by the American Academy of Environmental Engineers; and a Qualified Environmental Professional, certified by the Institute of Professional Environmental Practice.

I have prepared comments, responses to comments and sections of EIRs for both proponents and opponents of projects on air quality, water supply, water quality, hazardous waste, public health, risk assessment, worker health and safety, odor, risk of upset, noise, land use and other areas for well over 100 documents. This work includes Environmental Impact Reports (EIRs), Negative Declarations (NDs), and Mitigated Negative Declarations (MNDs) for all California refineries as well as various other permitting actions for tar sands and light shale crude refinery upgrades in Indiana, Louisiana, Michigan, Ohio, South Dakota, Utah, and Texas and liquefied natural gas (LNG) facilities in Texas, Louisiana, and New York. I was a consultant to a former owner of the subject refinery on CEQA and other environmental issues for over a decade and am thus very familiar with both the Rodeo Refinery and the Santa Maria Refinery and their joint operations.

My work has been cited in two published CEQA opinions: (1) *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (August 30, 2001) 111 Cal.Rptr.2d 598 and *Communities for a Better Environment v. South Coast Air Quality Management Dist. (2010) 48 Cal.4th 310*.

II. THE PROJECT IS PIECEMEALED

The Phillips 66 San Francisco Refinery (SFR) consists of two facilities linked by a 200-mile pipeline. Santa Maria RDEIR, Fig. 2-2. The Santa Maria Refinery (SMR) is located in Arroyo Grande, in San Luis Obispo County, while the Rodeo Refinery is located in Rodeo in the San Francisco Bay Area. The Santa Maria Refinery mainly processes heavy, high sulfur crude oil and sends semi-refined liquid products, *e.g.*, gas oil and pressure distillates[3], to the Rodeo Refinery for converting into finished products. See, *e.g.*, Propane Recovery RDEIR, p. 3-25.

[3] The permits to operate for the Santa Maria Refinery and various pump stations along the pipeline indicate that the materials sent from Santa Maria to Rodeo are gas oil and "pressure distillates." The "pressure distillates" are referred to as "naphtha" in the subject RDEIRs. However, there are different types of naphtha, depending upon the boiling range. Full range naphtha, which is presumably what "pressure distillate" is intended to capture, is the fraction of hydrocarbons boiling between 30 C and 200 C. It consists of a complex mixture of hydrocarbons generally having between 5 and 12 carbon atmos and comprises 15% to 30% of the crude oil by weight. Light naphtha is the fraction boiling between 30 C and 90 C and consists of molecules with 5 to 6 carbon atoms. See, *e.g.*, http://en.wikipedia.org/wiki/Naphtha.

Phillips 66 is planning to replace a significant portion of its baseline crude slate with cost-advantaged crudes delivered to its California refineries by ship and rail. There are currently four related projects at the San Francisco Refinery (comprising the Santa Maria and Rodeo Refineries) that have recently been permitted or that are currently in the process of being permitted that are inextricably linked and should have been evaluated as a single Project under CEQA. Two are located at the Rodeo end of the pipeline and two are located at the Santa Maria end of the pipeline. These four projects are:

1. Santa Maria Refinery Throughput Increase Project;[4]
2. Santa Maria Refinery Rail Spur Project (RDEIR);
3. Rodeo Refinery Propane Recovery Project;[5]
4. Rodeo Refinery Marine Terminal Offload Limit Revision Project.[6]

I previously commented on the relationship between the Santa Maria Refinery Throughput Project, the Santa Maria Refinery Rail Spur Project,[7] and the Rodeo Refinery Propane Recovery Project[8] in comments on previous CEQA documents. These comments are included here in Exhibits 2 and 3. I reassert these comments as they are still valid and have not been addressed in either the Santa Maria Refinery Rail Spur Project RDEIR or the Propane Recovery RDEIR.

However, the SMR Rail Spur Project and Rodeo Refinery Propane Recovery RDEIRs both raise a new issue that seeks to demonstrate that these two projects are not related. This new issue, an alleged vapor pressure constraint, has not been addressed in other comments on piecemealing. The SMR Rail Spur Project RDEIR, p. 2-31, asserts out of the blue, without mentioning the Rodeo Refinery Propane Recovery Project:

> "Prior to pipeline shipment to the Rodeo Refinery the naphtha and gas oils are stored in tanks located at the SMR. These storage tanks have vapor pressure limits are required by the San Luis Obispo County Air Pollution Control District (SLOAPCD) permit, which limits the vapor pressure to 11 pisa [sic]. Historically, and currently the SMR tanks operate at about 10 psia (pounds per square inch absolute). These pressure limits restrict the amount of propane/butane that can be contained in naphtha and gas oils that are shipped to the Rodeo Refinery. The majority of the

[4] Marine Research Specialists, Phillips 66 Santa Maria Refinery Throughput Increase Project, Final Environmental Impact Report, October 2012 (SMF FEIR); Available at: http://slocleanair.org/phillips66feir.

[5] Contra Costa County Department of Conservation and Development, Phillips 66 Propane Recovery Project Recirculated Draft Environmental Impact Report, SCH # 2012072046, October 2014, Available at: http://www.cccounty.us/DocumentCenter/View/33804.

[6] ERM and BAAQMD, CEQA Initial Study, Marine Terminal Offload Limit Revision Project, Phillips 66 Refinery, Rodeo, California, BAAQMD Permit Application 22904, December 2012; Phillips 66, Application for Authority to Construct and Minor Modification to Major Facility Review Permit, Revision of Permit Condition 4336 Part 7, Phillips 66 San Francisco Refinery; Major Facility Review Permit, Phillips 66 – San Francisco Refinery, Facility #A0016, Condition 4336, pp. 497-498, August 1, 2014.

[7] Phyllis Fox, Comments on Environmental Impact Report for the Phillips 66 Rail Spur Extension Project, Santa Maria, California, Prepared for Sierra Club, San Francisco, January 27, 2014.

[8] Phyllis Fox, Comments on Environmental Impact Report for the Phillips 66 Propane Recovery Project, Prepared for Shute, Mihaly & Weinberger LLP on behalf of Rodeo Citizens Association, November 15, 2013.

> propane/butane that is contained in the crude oils process at the SMR ends up in the refinery fuel gas. Figure 2-10 provides a simplified flow diagram of the SMR."

The Rodeo Refinery Propane Recovery Project RDEIR, on the other hand, includes a brief discussion of the Santa Maria Refinery. This discussion first asserts that "[t]he proposed Project [Propane Recovery] is independent of and would have no effect on SMF [Santa Maria Facility] operations." Propane RDEIR, p. 3-25. It goes on to make an argument, again out of the blue, that is very similar to the one cited above from the Santa Maria Refinery Rail Spur Project RDEIR (Propane RDEIR, pp. 3-25/26):

> "The storage tanks located along the 200-mile pipeline between the two refineries have maximum vapor pressure limits imposed by the San Luis Obispo County and San Joaquin Valley Air Pollution Control Districts which constrain the amount of butane and propane that can be included in the semi-refined products. Increasing the amount of butane and propane in the semirefined products would increase the vapor pressure of the material. Historically and currently these storage tanks contain products which are at or near the maximum vapor pressure limits. Additional butane and/or propane would cause the products to exceed the vapor pressure limits of the storage tanks. Accordingly, no new butane and propane can be added to the semi-refined products sent from the Santa Maria Refinery to the Rodeo Refinery regardless of the types of crude oil that may be processed at the Santa Maria Refinery."

These arguments attempt to demonstrate that there can be no link between these two projects as vapor pressure permit limits on tanks that store the gas oil and pressure distillate sent from Santa Maria to Rodeo would prohibit any increase in propane and butane as they historically and currently operate near their limits. These claims are incorrect as the assertions are wrong. There either are no vapor pressure limits on the subject tanks, or the materials stored in them have vapor pressures far below their permitted limits.

A. Vapor Pressure Constraints Are Unsupported

The RDEIRs contains no support whatsoever for these vapor pressure claims. Thus, it fails as a CEQA document. Support should include identification of the permits, tanks, and permit conditions that restrict vapor pressure and certified vapor pressure monitoring data for each subject tank. None of this information is in the record.

Therefore, I researched the issue, obtained permits, and identified the tanks that store the subject gas oil and pressure distillate, and obtained vapor pressure monitoring data from the San Luis Obispo County Air Pollution Control District (SLOCAPCD). My research indicates that these claims are wrong.

1. Santa Maria Refinery Tanks

The Santa Maria Refinery produces two semi-refined products – gas oil and pressure distillate. These products are stored in on-site tanks and sent by pipeline to the Rodeo Refinery to convert them to finished products such as gasoline. Emissions from these tanks are regulated by the SLOCAPCD Permit to Operate for the Santa Maria Refinery (Refinery Permit).[9] The Refinery Permit indicates that gas oil is stored in Tanks 800 and 801 and pressure distillate is stored in Tanks 550 and 511. PTO Conditions II.B.1.a and d, p. 8. The vapor pressure of the materials stored in these tanks should not appreciably change during pipeline transport to Rodeo. As discussed below, the vapor pressures of both gas oil and pressure distillate stored in tanks at the Santa Maria Refinery sent to Rodeo are significantly less than claimed in the RDEIRs.

a. Pressure Distillate Tanks 800/801

Pressure distillate, the more volatile of the two semi-refined products, is stored in 52,000-barrel, welded-shell, dome-roof tanks that are controlled by a methane blanket and vapor recovery system (Process A-2). These tanks must comply with SLOCAPCD Rule 425[10]. Rule 425, Section D.5.b applies. This section exempts these tanks from vapor pressure limits as emissions are controlled with a vapor loss control device listed in Section E.3 (E.3 Vapor Recovery System). Thus, there are no vapor pressure limits on the tanks that store pressure distillate that is sent to Rodeo as the vapors are recovered, contrary to the assertion in the SMR Rail Spur Project RDEIR that there is a vapor pressure limit of 11 psia.

The SMR Rail Spur Project RDEIR further asserts that the "SMR tanks operate at about 10 psia", without identifying the tanks. SMR Rail Spur Project RDEIR, p. 2-31. As gas oil is much less volatile, this comment likely refers to pressure distillate. Regardless, even if the pressure distillate tanks were limited to a vapor pressure of 11 psia (which they are not as they are otherwise controlled), the vapor pressure of the pressure distillate that is stored in them is not "about 10 psia". Rather, annual emission inventory data obtained from the SLOCAPCD (Exhibit 4) indicate that the pressure distillate tanks have operated at 6.2 psia over the period 2009 to 2013. Thus, the claims in the SMR Rail Spur Project RDEIR, p. 2-31, are wrong as to the pressure distillate storage tanks at the Santa Maria Refinery. These tanks do not have vapor pressure limits as they are controlled. Further, they are operating far below the erroneously claimed limit of 11 psia.

b. Gas Oil Tanks 500/501

Gas oil is stored in 76,500 barrel welded-shell, external floating pontoon roof, single shoe seal tanks. Rule 425, Section D.4, limits the vapor pressure of these tanks to 0.5 psia. Vapor pressure data that I obtained from the SLOCAPCD (Exhibit 4) indicate that the gas oils stored in these tanks had true vapor pressures of 0.27 psia over the period 2009 to 2013, much less

[9] Permit to Operate No. 44-52, Phillips 66 Company - Santa Maria Refinery, November 6, 2013.

[10] SIP Rule 407.A.2, also cited in this condition, is superceded by Rule 425. Email from Dean Carlson, SLOCAPCD, to Phyllis Fox, November 21, 2014, Re: SMR Questions, Response (2).

than 0.5 psia. The SLOCAPCD permit engineer explained that when higher vapor pressure material is encountered, it is routed to the pressure distillate tanks.[11]

2. The SMR-to-Rodeo Refinery Pipeline

The semi-refined products stored in Tanks 500, 501, 800, and 801 are pumped into the 200-mile long pipeline and sent to Rodeo for refining into finished products. There are several pump stations along this pipeline, used to increase the pressure as needed to overcome pressure losses from friction during transport. Storage tanks are present at some of these pump stations.

These materials are generally sent directly to Rodeo, without being diverted to tanks along the pipeline, as suggested in the Propane Recovery Project RDEIR, pp. 3-25/26. Phillips Pipeline LLC modified operation of this pipeline several years ago to reduce off-loading of gas oil and pressure distillate at pump stations.[12] While it is possible that an upset or operational abnormality could require material to be temporarily offloaded at pump station tanks, this is not the normal operational mode. Further, as discussed elsewhere, the vapor pressure of the semi-refined products are far below the vapor pressure limits. The former Creston and Summit pump stations were not needed after the operational change and thus no longer have active permits.[13] Other pump stations along the pipeline are primarily used just to push the material along.[14]

Thus, gas oil and pressure distillate that enters the pipeline at Santa Maria arrive at Rodeo with the same vapor pressure. The operation is steady state with little variation in measured vapor pressures from year to year.[15] The vapor pressure data reported by SLOAPCD (Exhibit 4) indicates that these tanks operate far below their permit limits. Within the SLOCAPCD, only the Santa Margarita and Shandon pump stations have active SLOCAPCD permits for storage tanks.

a. SLOCAPCD Pump Stations

Santa Margarita Pump Station Tanks

The Santa Margarita Pump Station Permit to Operate[16] lists four tanks. Three of them (55422, 55408, 110404) have vapor pressure limits of 11 psia, consistent with pressure distillate. Two of these pressure distillate tanks (55422, 55408) are vented to a carbon absorption vapor control system when pressure distillate is stored. The fourth tank (175420) has a vapor pressure limit of 1.5 psia. Vapor pressure data that I obtained from the SLOCAPCD (Exhibit 4) indicates the following vapor pressure ranges for these four tanks over the period 2009 to 2013:

[11] Personal communication, Dean Carlson, SLOCAPCD, to Phyllis Fox, November 20, 2014.

[12] Email from Dean Carlson, SLOCAPCD, to Phyllis Fox, November 21, 2014, Re: SMR Questions, Response (5).

[13] Email from Dean Carlson, SLOCAPCD, to Phyllis Fox, November 20, 2014, Re: P66 Pump Stations.

[14] Email from Dean Carlson, SLOCAPCD, to Phyllis Fox, November 21, 2014, Re: SMR Questions, Response (5).

[15] Email from Dean Carlson, SLOCAPCD, to Phyllis Fox, November 21, 2014, Re: SMR Questions, Response (4).

[16] SLOAPCD, Permit to Operate Number 404-9, Phillips Pipeline LLC, Santa Margarita Pump Station, May 2, 2012, Condition 5.

- Tank 55408: 0.26 to 4.79 psia (limit: 11 psia)
- Tank 55422: 0.36 to 5.05 psia (limit: 11 psia)
- Tank 11040: 0.24 to 0.4 psia (limit: 11 psia)
- Tank 175420: 0.07 to 0.49 psia (limit: 1.5 psia)

All of these tanks are operating at vapor pressures far below their permit limits. Thus, the claim in the RDEIRs that they are operating close to their limits, precluding any increase in propane and butane, is incorrect.

Shandon Pump Station Tank

The Shandon Pump Station Permit to Operate lists a single 35,000 barrel pontoon floating roof tank, permitted to store organic liquids with a true vapor pressure not to exceed 1.5 psia.[17] The SLOCAPCD inventory data also indicate that gas oil has been stored in this tank. Over the period 2009 to 2013, the true vapor pressure ranged from 0.12 psia to 0.24 psia, substantially lower than the 1.5 psia vapor pressure limit. Thus, the claim in the RDEIRs that this tank is operating close to its vapor pressure limit, precluding any increase in propane and butane, is incorrect.

b. SJVAPCD Pump Station Tanks

There are five pump stations in the San Joaquin Valley Air Pollution Control District (SJVAPCD) along the subject pipeline that have active permits to operate and which include tanks that could store gas oils and pressure distillate, if offloaded during transit to the Rodeo Refinery: (1) McKittrick (S1521); (2) Sunset (S 1522): (3) Shale (S1523); (4) Midway (S1525); and (5) Junction (S 1518). While I was unable to obtain either permits to operate or vapor pressure data for these tanks due to inadequate review time, there is no reason to expect that the vapor pressure of the SMR gas oils and pressure distillates shipped out of the SLOCAPCD into the segment of the pipeline under the jurisdiction of the SJVAPCD (and beyond the Bay Area Air Quality Management District (BAAQMD)) would change during transit to Rodeo. Further, there would be little if any reason to transfer pipeline material into these tanks, once destined for Rodeo.

[17] SLOCAPCD, Permit to Operate Number 505-4, Phillips Pipeline LLC, Shandon Pump Station, May 2, 2012, Condition 5.

B. Refinery Fuel Gas

The SMR Rail Spur Project RDEIR asserts that the majority of the propane and butane would be partitioned into the refinery fuel gas. SMR Rail Spur Project RDEIR, p. 2-31. This depends on the design of the crude tower, *i.e.*, the temperature cut points, which was not disclosed in the RDEIR. Distillate cut points could be optimized to route more of the propane and butane into the naphtha. However, I agree that most of the butane likely would be partitioned into the refinery fuel gas, but a significant amount of the propane would be present in the pressure distillate. Butane is present in much lower amounts than propane in the tar sands crudes identified in the RDEIR.

Regardless, the amount partitioned to the fuel gas at Santa Maria would depend on the amount present in the imported crudes, which would depend largely on the type of diluent if tar sands are imported, or otherwise, the specific light crude, as some are highly enriched in propane and butane.

The SMR Rail Spur Project RDEIR fails as a CEQA informational document as none of the information required to address this point is disclosed. Further, the semi-refined products from refining rail-imported crudes at the Santa Maria Refinery will generate additional amounts of propane and butane when refined at Rodeo, compared to the SMR baseline crude slate. Thus, the fuel gas argument is without merit.

C. Source of Increased Amounts of Propane and Butane Feedstocks at Santa Maria Refinery

The Santa Maria Rail Spur Project and Propane Recovery Project RDEIRs attempt to rebut any connection between these two projects by hiding behind the vapor pressure argument. However, this argument is not persuasive, as demonstrated above. In fact, most all of the cost-advantaged crudes flooding into the market will allow the SMR to produce propane/butane-rich, semi-refined products and the Rodeo Refinery to recover more propane and butane from them than available in their baseline crude slates.

The amount of propane and butane (or its precursors) in the Santa Maria Refinery rail-imported crudes could be substantial, significantly more than in the SMR baseline crude slate, depending upon the specific crudes that are imported. Pressure distillate is the lighter of the two semi-refined products sent to Rodeo. It is mostly naphtha with some material in the kerosene and diesel boiling range. The raw naphtha, for example, can contain significant amount of pentane,[18] which would be recovered at Rodeo by the Propane Recovery Project. Naphtha, for example, is a feed to the proposed LPG[19] Recovery Unit at the Rodeo Refinery. Further, Santa Maria Refinery gas oil is a feed to various hydrocracking units at Rodeo that break it down into recoverable propane and butane feedstocks.

[18] See, for example, Tesoro Material Safety Data Sheet, Naphtha; Available at: http://www.collectioncare.org/MSDS/naphthamsds.pdf.

[19] LPG = Liquefied Petroleum Gas = propane + butane.

The SMR Rail Spur Project RDEIR states that rail-imported crude oils would be sourced from oilfields throughout North America based on market economics and other factors. SMR Rail Spur Project RDEIR, pp. 1-4 & 2-22. The RDEIR identifies two tar sands crudes (RDEIR, pp. 2-3, 4.12-27, Tables 2.6 & 4.3.13, 4.7.14) and admits it has received another for about one year. SMR Rail Spur Project RDEIR pp. ES-14, 4.13-27, 2-31, 2-33, 5-3. While it asserts Bakken crudes will not be imported, the RDEIR does not contain any conditions that restrict the types of crudes that will be imported. Thus, the Santa Maria RDEIR should have evaluated the full range of potential cost-advantaged crudes that could be imported. The crudes that the RDEIR specifically identifies, plus other cost-advantaged crudes available in the market, would increase the amount of propane and butane that could be recovered at the Rodeo Refinery, compared to the SMR baseline. These various crudes are discussed below.

1. DilBit Tar Sands Crudes

The SMR Rail Spur Project RDEIR identifies Access Western Blend[20] and Peace River Heavy[21] as potential crudes that could be delivered via rail and processed at the Santa Maria Refinery. SMR Rail Spur Project RDEIR, pp. 2-3, 4.12-27, Tables 2.6 & 4.3.13, 4.7.14. The RDEIR also admits that SMR has received Canadian tar sands crude oil for about one year (post-baseline), specifically Kearl Lake, which made up 2% to 7% of the processed crude slate. SMR Rail Spur Project RDEIR pp. ES-14, 4.13-27, 2-31, 2-33, 5-3. The RDEIR also asserts that Bakken crudes will not be imported. However, the RDEIR does not contain any conditions that restrict the type of crudes that will be imported. Thus, the RDEIR should have evaluated the full range of potential cost-advantaged crude imported.

Most tar sands crudes are too heavy to flow in a pipeline and to be transported in the type of railcar proposed for the Project (*i.e.*, no steam coils or dedicated steaming facilities at Santa Maria), or unloaded and transferred to on-site storage tanks. Thus, they must be diluted or thinned with a lighter hydrocarbon stream to reduce viscosity. These diluted tar sands crudes are called "DilBits," which is a shorthand expression for blends of **dil**uent and tar sands **bit**umen. All of the tar sands crudes mentioned in the RDEIR are DilBits. A DilBit typically contains 25% to 30%+ diluent. The diluent is typically natural gas condensate, pentanes, or naphtha.[22] Diluent presents two opportunities to increase the amount of propane and butane that could be recovered at Rodeo.

First, chemical composition data for the three tar sands crudes identified in the RDEIR indicates they are loaded with propanes and butanes. Peace River Heavy contains 0.83 vol% butanes and 7.05 vol% pentanes.[23] Access Western Blend contains 0.69 vol% butanes and

[20] http://www.crudemonitor.ca/crude.php?acr=AWB.

[21] http://www.crudemonitor.ca/crude.php?acr=PH.

[22] Gary R. Brierley, Visnja A. Gembicki, and Tim M. Cowan, Changing Refinery Configurations for Heavy and Synthetic Crude Processing, Available at: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7BA07DE342-E9B1-402A-83F7-36B18DC3DD05%7D&documentTitle=5639138.

[23] http://www.crudemonitor.ca/crude.php?acr=PH.

8.67% propanes.[24] Kearl Lake contains 0.83 vol% butanes and 10.2 vol% propanes.[25] Thus, it is indisputable that the targeted tar sands crude would contribute to the butane and propane that would be recovered by the Propane Recovery Project at Rodeo.

The SMR Rail Spur Project RDEIR alleges these butanes and propanes would be partitioned into the refinery fuel gas at SMR and thus would not reach the Rodeo Refinery. Most of the butane, present in much smaller amounts, could be partitioned to the fuel gas, depending on the temperature cut points of the distillation tower. However, most of the propane would remain in the straight run naphtha produced in the crude tower. SMR Rail Spur Project RDEIR, Fig. 2-10. Thus, the amount of butane and propane remaining in the semi-refined products headed to Rodeo, principally the pressure distillate, would be higher than in the baseline in which only heavy sour crudes were processed. SMR Rail Spur Project RDEIR, pp. 2-31. Further, operation of the crude tower could be modified to incorporate more of the propane and butane into the naphtha fraction.

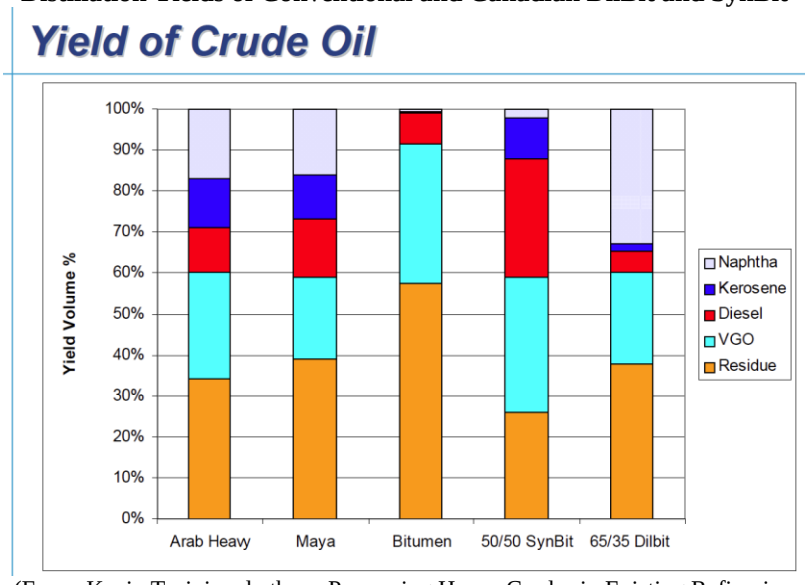
Second, DilBits, when refined, will yield much greater amounts of naphtha,[26] the lighter component of the pressure distillate sent to Rodeo and one of the feedstocks for propane recovery. Propane Recovery Project RDEIR, Fig. 3-6. The higher yield of naphtha from distilling DilBits, compared to heavy crudes, is illustrated in Figure 1. This bar chart compares the output of the distillation column (crude tower) for two commonly refined conventional heavy crudes (Arab Heavy and Maya, which are similar to the Santa Maria Refinery baseline crude slate) and three Canadian tar sands crudes (raw bitumen, SynBit, and DilBit). The last bar in Figure 1, 65/35 DilBit (65% bitumen, 35% diluent) is most similar to the crudes identified in the SMR Rail Spur Project RDEIR. Raw bitumen would be unlikely in large amounts without additional steam support at the proposed rail terminal. The SMR is not designed to refine SynBits so they also are unlikely imports.

[24] http://www.crudemonitor.ca/crude.php?acr=AWB.

[25] http://www.crudemonitor.ca/crude.php?acr=KDB.

[26] N. Yamaguchi, Tight Oil and Oil Sands in the U.S. Crude Slate: What Fuel Marketers Need to Know, Available at: http://fuelmarketernews.com/tight-oil-oil-sands-u-s-crude-slate-fuel-marketers-need-know/.

Figure 1
Distillation Yields of Conventional and Canadian DilBit and SynBit



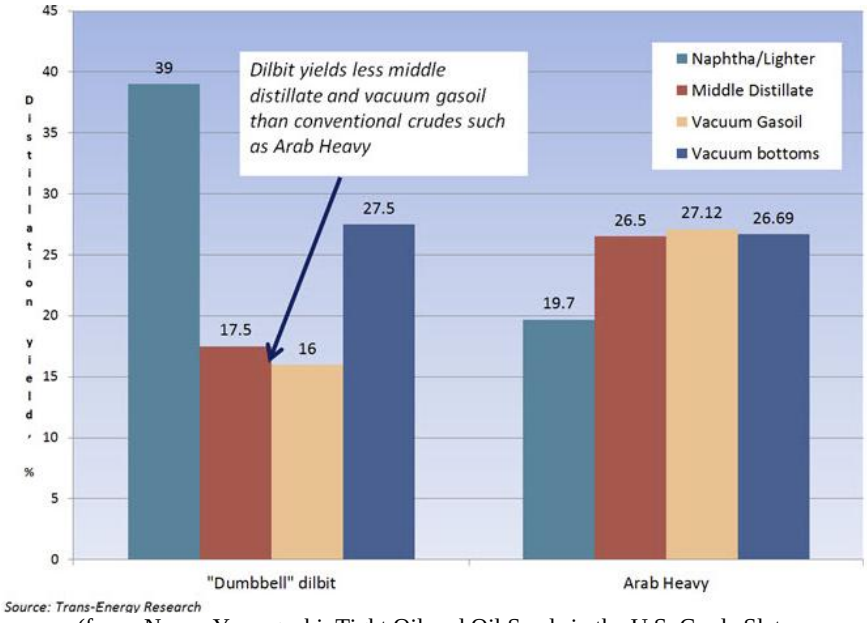
(From: Kevin Turini and others, Processing Heavy Crudes in Existing Refineries, Slides, 2011 AIChe Meeting, Chicago, IL

DilBits are sometimes referred to as "dumbbell" or "barbell" crudes as the majority of the diluent is C_5 to C_{12} and the majority of the bitumen is C_{30}+ boiling range material, with very little in between.[27] This means these crudes have a lot of material boiling at each end of the boiling point curve, but little in the middle. The 65/35 DilBit bar in Figure 1 indicates that these crudes generate about twice as much "naphtha" as the heavy crudes they would replace.

This is further confirmed by a different distillate yield bar chart from another source in Figure 2. This figure likewise confirms that switching from a heavy crude to a DilBit crude would roughly double the amount of naphtha distilled from the crude, from 19.7% to 39% and decrease gas oil from 27% to 16%. Additional amounts of both naphtha and gas oil would be produced by cracking the vacuum bottoms in the coker.

[27] Gary R. Brierley and others, Changing Refinery Configuration for Heavy and Synthetic Crude Processing, 2006; Available at: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7BA07DE342-E9B1-402A-83F7-36B18DC3DD05%7D&documentTitle=5639138.

Figure 2
Distillation Yields of a Conventional Heavy Crude (Arab Heavy) and DilBits



(from: Nancy Yamaguchi, Tight Oil and Oil Sands in the U.S. Crude Slate: What Fuel Marketers Need to Know, Fuel Marketer News; Available at: http://fuelmarketernews.com/tight-oil-oil-sands-u-s-crude-slate-fuel-marketers-need-know/

The DilBits yield very little middle distillate fuels, such as diesel, heating oil, kerosene, and jet fuel and more coke, than other heavy crudes. A typical DilBit, for example, will have 15% to 20% by weight light material, basically the added diluent, 10% to 15% middle distillate, and the balance, >75% is heavy residual material (vacuum gas oil and residue) exiting the distillation column. These characteristics, which distinguish DilBits from the current baseline crude slate, have two major implications.

First, refining of DilBits at SMR will generate more naphtha, the lighter semi-refined product, and less gas oil, thus changing the semi-refined product distribution. The increased amount of naphtha, when processed at the Rodeo Refinery, will generate more propane and butane. Naphtha, for example, is one of the feeds to the proposed LPG Recovery Unit. Propane Recovery Project RDEIR, Fig. 3-6. In other words, the increased amounts of naphtha produced from imported DilBit tar sands (or light tight crudes) would contain higher amount of propane and butane precursors, which would not be partitioned to refinery fuel gas at the Santa Maria Refinery as they would be present in the pressure distillate and refined at the Rodeo Refinery to recover butane and propane.

The Project proposes to import 37,142 bbl/day of cost-advantaged crudes by rail. The average baseline crude throughput for the Santa Maria Refinery (2010-2012) is 38,029 bbl/day. SMR Rail Spur Project RDEIR Table 2.7. Throughput data obtained from the SLOCAPCD indicates that this crude input generated 20,714 bbl/day of gas oil and 11,633 bbl/day of pressure distillate. Exhibit 5. Figures 1 and 2 indicate that DilBits could roughly double the amount of naphtha distilled from the crude oil. Assuming that all of the pressure distillate is naphtha, replacing 37,142 bbl/day of conventional heavy crudes with an equivalent amount of DilBit crude could increase naphtha yield from 11,633 bbl/day to 22,723 bbl/day (37,142/38,029 ×

11,633 × 2 = 22,723) in the baseline and significantly more once the SMR Throughput Project is operating at capacity. This significant increase in naphtha in the pressure distillate sent to Rodeo would allow the recovery of significant additional propane and butane at the Rodeo Refinery, relative to the baseline. This increase in naphtha in the pressure distillate would not exceed any tank vapor pressure limits as all of the tanks are operating far below their limit and the vapor pressure of the naphtha itself and the pressure distillate in which it is present are less than tank vapor pressure limits.

Second, the refining of DilBits at SMR will increase the amount of coke. This would increase emissions from coke dust and truck transport of coke, an impact not disclosed in the SMR Rail Spur Project RDEIR. This is further discussed in Comment III.

2. Other Tar Sand Crudes

The RDEIR also does not exclude the import of heavier tar sands crudes. In general, at refineries with cokers, such as Santa Maria Refinery, even decreases in API gravity (*i.e.*, heavier crude) can result in more propane and butane in the semi-refined products.[28]

3. Light Crudes

Finally, while the RDEIR asserts that Bakken crudes would not be imported (SMR Rail Spur Project RDEIR, pp. ES-5, 1-4, 2-1, 2-22), there are many other cost-advantaged light crudes that could be imported by rail. In general, the lighter the crude, the more butane and propane that can be recovered when it is refined.[29] These include new sources of cost-advantaged North American crudes, such as from the Permian (west Texas), Eagle Ford (south Texas), Granite Wash (Texas Panhandle), and Niobrara (Colorado) basins,[30] as well as Rocky Mountain Sweet (Casper, WY), and Mississippian Lime (Oklahoma).[31] Many of these crudes are already being refined by Phillips 66.[32] These crudes contain significant amounts of propane and butane and their precursors. The RDEIR does not exclude the rail import of any of these light, cost-advantaged crudes.

[28] NPC North American Resource Development Study, September 15, 2011, p. 18.

[29] See, *e.g.*, NPC North American Resource Development Study, Natural Gas Liquids (NGLs), September 15, 2011, p. 18; Available at: http://www.npc.org/prudent_development-topic_papers/1-13_ngl_paper.pdf.

[30] Dangerous Goods Transport Consulting, Inc., 2014, p. 23 (vol% C2 – C5 in Eagle Ford crude reported as 8.3%); Available at: composhttps://www.afpm.org/WorkArea/DownloadAsset.aspx?id=4229.

[31] Alan Mazaud, Exergy Resources, May 23, 2013, Pennsylvania Rail Freight Seminar, Slide: Growth of Domestic Production of Tight Oil.

[32] Phillips 66 Third Quarter Conference Call Slides, October 29, 2014; Available at: http://investor.phillips66.com/files/doc_presentations/2014/Earnings/PSX-Q3-News-Release-Slides-FINAL_v001_k94fx2.pdf.

4. Other Sources of Propane/Butane

The gas oils and naphthas sent to Rodeo would be further refined. This refining itself produces propane and butane. For example, the pressure distillate would be fed to hydrotreaters and hydrocrackers, which would produce propane- and butane-rich streams. The gas oils would be feed to cokers and hydrotreaters, which would also produce propane- and butane-rich streams. Thus, the increased amount of propane and butane that could be recovered when these semi-refined products generated from a lighter crude slate are further refined at Rodeo. Additional propane and butane could be generated at Rodeo itself by switching to a lighter crude slate.

D. Summary

In sum, the claims made in the RDEIRs in an attempt to decouple the Santa Maria Refinery Rail Spur Project and the Rodeo Refinery Propane Recovery Project based on vapor pressure limits have no merit. Some of the tanks have no vapor pressure limits at all, as vapors are recovered. All of the tanks operate far below their permitted vapor pressure limits. Further, the pipeline is operated to send semi-refined materials directly to Rodeo, without interim storage in pump station tanks along the pipeline. Even if semi-refined products had to be offloaded, their vapor pressures are far below permit limits. Thus, there is ample head room to increase the vapor pressure of semi-refined products shipped from Santa Maria to Rodeo.

III. EMISSIONS ARE UNDERESTIMATED

The SMR Rail Spur Project RDEIR estimated emissions from locomotives, fugitive emissions from railcars, pipeline components and crude oil storage tanks, a vapor recovery carbon canister, and vehicle traffic. SMR Rail Spur Project RDEIR, Sec. 4.3.4.2 & Appx. B. However, it omitted other sources of emissions, discussed below.

The SMR Rail Spur Project is proposing to replace the **majority** of the current crude slate (2010-2012: 38,100 bbl/day) with up to 100% tar sands crudes. The Project proposes to import 37,142 bbl/day of cost-advantaged crudes by rail. SMR Rail Spur Project RDEIR, p. 2-23. Thus, the Project would replace 97% of the baseline crude slate with up to 100% tar sands crude. The Throughput Increase Project will increase the crude permit level to 48,950 bbl/day. SMR Throughput Increase FEIR, p. 1-1. Thus, at full buildout, up to 76% of the crude slate will be different crudes than in the baseline, potentially 100% tar sands crudes. These new crudes have many chemical and physical properties that distinguish them from the baseline crude slate and that will result in impacts that were not evaluated in the SMR Rail Spur Project RDEIR. These were discussed for both tar sands and light crudes in my previous comments in Exhibits 2 and 3, which are incorporated here by reference.

A. Emission Changes Due To Changes in Fuel Gas Composition

The SMR Rail Spur Project RDEIR asserts that if significant amounts of propane and butane were present in the imported crudes, as discussed in Comment II, they would be partitioned into the Santa Maria refinery fuel gas. Assuming, *arguendo*, that this is correct, it

would significantly increase the heat content of the refinery fuel gas. This would have several impacts. First, combustion temperatures would be higher in all heaters and boilers, as propane and butane burn with a hotter flame than natural gas and baseline refinery fuel gas, not enriched with propane and butane.[33] This would increase emissions nitrogen oxides (NOx) from all refinery fuel gas fired sources, compared to the baseline. Second, propane and butane have higher GHG global warming potentials than other components in refinery fuel gas.[34] Thus, greenhouse gas emissions from all heaters and boilers would increase. Finally, the significant increase in heat content may require modification or replacement of existing burner in heaters and boilers. None of these impacts were addressed in the SMR Rail Spur Project RDEIR.

B. Increased Combustion Emissions from Tar Sands Bitumen Not Evaluated

The SMR Rail Spur Project RDEIR indicates that tar sands crudes will be imported. The composition of tar sands crudes is chemically different from other heavy crudes currently processed at the SMR as they are tar sands bitumen mixed with diluent. They are unique for two major reasons: (1) presence of large quantities of volatile diluent full of reactive organic gases (ROG) and toxic chemicals as discussed above and (2) unique chemical composition of the bitumen, the heavy fraction. The previous comment discussed diluent, which will modify the composition of the both the semi-refined products sent to the Rodeo Refinery and the SMR refinery fuel gas. This comment discusses the unique composition of tar sands bitumens that require more intense processing and thus result in higher emissions.

Tar sands bitumens are composed of higher molecular weight chemicals and are deficient in hydrogen compared to conventional heavy crudes. This means more energy will be required and more emissions produced to convert them into the same slate of semi-refined and refined products. More energy will be required to add hydrogen and break the bonds of the larger molecules.

The SMR Rail Spur Project RDEIR concedes the hydrogen point. However, the SMR Rail Spur Project RDEIR argues that hydrogen addition occurs at the Rodeo Refinery, not at the Santa Maria Refinery, and thus did not include these emissions. SMR Rail Spur Project RDEIR, pp. 4.3-69/70. However, as explained in my comments in Exhibits 2 and 3 and comments by others on the SMR Rail Spur Project RDEIR (Pless 2014[35]; Karras 2014), the Rodeo Refinery Propane Recovery Project and the SMR Rail Spur Project should have been evaluated under CEQA as a single project as they depend on each other. Thus, the increase in emissions of criteria pollutants and greenhouse gases from most fired sources due to tar sands bitumen derived semi-refined products refined at the Rodeo Refinery should have been included in the emission inventory for the SMR Rail Spur Project.

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[33] Flame Temperatures of Some Common Gases; Available at; http://www.engineeringtoolbox.com/flame-temperatures-gases-d_422.html.

[34] See, *e.g.*, http://www.epa.gov/climateleadership/documents/emission-factors.pdf.

[35] Letter from Petra Pless to Laura Horton, Re: *Review of the Phillips 66 Company Rail Spur Extension and Crude Unloading Project Revised Public Draft Environmental Impact Report and Vertical Coastal Access Project Assessment*, November 21, 2014.

The Rodeo Refinery RDEIR is silent as to other crude quality factors that will increase emissions at Rodeo. Canadian tar sands bitumen is distinguished from conventional petroleum by the small concentration of low molecular weight hydrocarbons and the abundance of high molecular weight polymeric material.[36] Crudes derived from Canadian tar sands bitumen – DilBits, SCOs and SynBits – are heavier, *i.e.*, have larger, more complex molecules such as asphaltenes and resins,[37] some with molecular weights above 15,000.[38] They are the nonvolatile fractions of petroleum and contain the highest proportions of sulfur, nitrogen, and oxygen.[39] They have a marked effect on refining and result in the deposition of high amounts of coke during thermal processing in the coker, which would occur at the Santa Maria Refinery. They require more intense processing in the coker to break them down into lighter products.

These differences are not reflected in any of the lumper parameters (API gravity, vacuum resid percentage, sulfur, TAN) presented in the SMR Rail Spur Project RDEIR. SMR Rail Spur Project Table 4.3-13 and p. 4.3-70. These differences mean that the coker at the Santa Maria Refinery will have to work harder to convert vacuum bottoms from distilling tar sand crude into gas oil, which will increase combustion emissions of NOx, sulfur oxides (SOx), carbon monoxide (CO), ROG, particulate matter with an aerodynamic diameter of 10 and 2.5 micrometers or less (PM10 and PM2.5), and greenhouse gases (GHGs). These increases in emissions were not included in the emission inventory.

C. Increased Metal Content from Tar Sands Were Not Evaluated

The Project could increase the import of heavy sour tar sands crude by up to 76% of the entire permitted capacity of the Santa Maria Refinery, once the SMR Throughput Project is fully operational. These crudes have higher metal content than the baseline crude slate.[40] This represents a significant increase in a type of crude that will increase emissions compared to the

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[36] O.P. Strausz, The Chemistry of the Alberta Oil Sand Bitumen; Available at: http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22_3_MONTREAL_06-77_0171.pdf.

[37] Asphaltenes are nonvolatile fractions of petroleum that contain the highest proportions of heteroatoms, i.e., sulfur, nitrogen, oxygen. The asphalt fraction is that portion of material that is precipitated when a large excess of a low-boiling liquid hydrocarbon such as pentane is added. They are dark brown to black amorphous solids that do not melt prior to decomposition and are soluble in benzene and aromatic naphthas.

[38] O.P. Strausz, The Chemistry of the Alberta Oil Sand Bitumen; Available at: http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22_3_MONTREAL_06-77_0171.pdf.

[39] James G. Speight, The Desulfurization of Heavy Oils and Residua, Marcel Dekker, Inc., 1981, Tables 1-1, 2-2, 2-3, 2-4 and p. 13 and James G. Speight, Synthetic Fuels Handbook: Properties, Process, and Performance, McGraw-Hill, 2008, Tables A.2, A.3, and A.4.

[40] Straatiev and others, 2010, Table 1; Brian Hitchon and R.H. Filby, Geochemical Studies - 1 Trace Elements in Alberta Crude Oils; http://www.ags.gov.ab.ca/publications/OFR/PDF/OFR_1983_02.PDF; F.S. Jacobs and R.H. Filby, Trace Element Composition of Athabasca Tar Sands and Extracted Bitumens, Atomic and Nuclear Methods in Fossil Energy Research, 1982, pp 49-59; James G. Speight, The Desulfurization of Heavy Oils and Residua, Marcel Dekker, Inc., 1981, Tables 1-1, 2-2, 2-3, 2-4 and p. 13 and James G. Speight, Synthetic Fuels Handbook: Properties, Process, and Performance, McGraw-Hill, 2008, Tables A.2, A.3, and A.4; Pat Swafford, Evaluating Canadian Crudes in US Gulf Coast Refineries, Crude Oil Quality Association Meeting, February 11, 2010; Available at: http://www.coqa-inc.org/20100211_Swafford_Crude_Evaluations.pdf .

current Refinery slate. The impacts from this change were not evaluated in the SMR Rail Spur Project RDEIR.

The U.S. Geological Survey (USGS) reported that "natural bitumen," the source of all Canadian tar sands-derived oils, contains 102 times more copper, 21 times more vanadium, 11 times more sulfur, six times more nitrogen, 11 times more nickel, and 5 times more lead than conventional heavy crude oil, such as those currently refined from local sources.[41] The SMR Rail Spur Project RDEIR reported vanadium and nickel concentration in a current "typical crude blend" compared to two potential tar sands crudes. SMR Rail Spur Project RDEIR, Table 4.3-13. This comparison shows that the vanadium concentration in Access Western Blend (190 ppmw) and Peak River Heavy (167 ppmw) are higher than the upper end of the range of major baseline crude sources. The SMR Rail Spur Project RDEIR is silent as to the significance of this reported increase in vanadium. The SMR Rail Spur Project RDEIR did not present any data for any other metal, known to be elevated in tar sands crudes.

The environmental damage caused by these metal pollutants includes bioaccumulation of toxic chemicals up the food chain and a direct health hazard from air emissions. These metals, for example, mostly end up in the coke. Thus, higher levels of metals will be present in the coke dust and coke pile runoff/seepage. The SMR Rail Spur Project DEIR indicated that "[m]etals that are present in coke have been detected in groundwater at concentrations above the California Department of Health maximum contamination levels (MCL) in the area around the coke pile runoff area..." SMR Rail Spur Project DEIR, p. 4.7-39/40. This statement has vanished from the SMR Rail Spur Project RDEIR. Thus, a switch to tar sands crude could contribute to this existing significant impact from the coke pile, which was not disclosed in the SMR Rail Spur Project RDEIR.

Further, larger amounts of coke may be produced by the tar sands crudes than the current crude slate. The metal content of fugitive dust from coke piles could increase to dangerous levels. The California Air Resources Board, for example, has classified lead as a pollutant with no safe threshold level of exposure below which there are no adverse health effects. Thus, just the increase in lead from switching to tar sands crude is a significant impact that was not disclosed in the SMR Rail Spur Project RDEIR. Accordingly, crude quality is critical for a thorough evaluation of the impacts of a crude switch as facilitated by rail import to the SMR.

[41] R.F. Meyer, E.D. Attanasi, and P.A. Freeman, Heavy Oil and Natural Bitumen Resources in Geological Basins of the World, U.S. Geological Survey Open-File Report 2007-1084, 2007, p. 14, Table 1; Available at http://pubs.usgs.gov/of/2007/1084/OF2007-1084v1.pdf.

D. Sump Emissions Were Omitted

Unloading facilities generally include liquid spill containment sumps with the capacity to contain the contents of at least one tank car. Crude oil that spills into these sumps would release vapors including ROG, which are ozone precursors, and toxic air contaminant (TAC) emissions. The RDEIR is silent as to sumps and their emissions.

E. Rail Car Fugitive Emissions Were Omitted

ROG and TACs are emitted from rail cars from their point of origin through unloading as rail cars are not vapor tight. The SMR Rail Spur Project RDEIR did not include these emissions.

The crude oil would be shipped in tank cars, such that the volume of loaded crude oil shipped is less than the capacity of the rail car to accommodate expansion during shipping. This volume reduction creates free space at the top of the tank car, which provides space for entrained gases, such as those from diluent, to be released from the crude oil[42] and emitted to the atmosphere during transit and idling in rail yards.[43]

As rail cars are not vapor tight, these vapors in the head space above the oil are emitted to the atmosphere during rail transport and at the unloading terminal. The vapor in the headspace can flash during transport, when temperature increases or pressure drops, causing valves to open, emitting ROG and TACs.

These losses are consistent with the well-known "crude shrinkage" issue associated with crude by rail. The crude delivered is significantly less than the crude loaded. The reported range in crude shrinkage is 0.5% to 3% of the loaded crude.[44] Some of this shrinkage is likely due to emissions from the rail car during transit. The emissions of ROG and TACs from rail cars has been confirmed by field measurements.[45] The SMR Rail Spur Project RDEIR did not include these ROG and TAC emissions in its emission calculations or the health risk assessment.

Tank cars have domes to allow space for the product to expand as temperatures rise. Each dome has a manhole through which the tank car can be loaded, unloaded, inspected, cleaned, and repaired. Dome covers may be hinged and bolted on or screwed on. Most domes

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[42] Anthony Andrews, Congressional Research Service, Crude Oil Properties Relevant to Rail Transport Safety: In Brief, February 18, 2014, pp. 8-9.

[43] A DOT 111 (or comparable) tank car generally has a capacity of 34,500 gallons or 263,000 lbs. gross weight on rail. Under some conditions, the maximum gross weight can be increased to 286,000 lbs. At an API gravity of 50°, a tank car can hold its maximum volume of 31,800 gallons and not exceed the 286,000 lb gross weight on rail limit. As the API gravity drops, the amount of oil that can be carried must also drop. Thus, a tank car of Bakken crude, at its highest density of 39.7° API, can only hold 30,488 gallons, a volume reduction of about 1,300 gallons. Further, as crude oil density (and thus API gravity) is temperature dependent, volume will increase as temperature increases. Thus, the shipper may have to reduce the shipped volume even further. This volume reduction creates a space above the crude oil where vapors accumulate.

[44] Alan Mazaud, Exergy Resources, Pennsylvania Rail Freight Seminar, May 23, 2013, p. 17. Available at: http://www.parailseminar.com/site/Portals/3/docs/Alan%20Mazaud%20Presentation%20-%20AM.pptx

[45] http://www.youtube.com/watch?v=35uC1gLctnw.

have vents and safety valves to let out vapors.[46] Thus, they are sources of ROG emissions that were omitted from the emission calculations. Further, when dome covers are left open, any residual vapors escape to atmosphere. Residual material clings to the bottom and sides of empty rail cars and emits ROG and TACs while the rail cars idle at the site, waiting for the entire unit train to be unloaded. Open covers are common in rail yards as they are opened for inspections and repairs. The ROG and TAC emissions from these sources were not included in the SMR Rail Spur Project RDEIR's emission inventory.

Further, each tank car has a bottom outlet which is used for loading and unloading that includes pumps, manifolds, and valves, all of which leak ROG and TACs. Finally, liquid leaks occur when unloading arms are disconnected, even with state-of-the-art no leak arms. These disconnect leaks evaporate, contributing to ROG and TAC emissions.

An estimate of these emissions can be based conservatively on the lower end of the range of crude shrinkage (0.5%) discussed above and the maximum freight weight per car of 106 tons from the TRN Spec Sheet-1. Assuming 80 cars/train and five unit trains per week (SMR Rail Spur Project RDEIR, p. ES-5), a total of 30 ton/day[47] of ROG can be emitted as the trains travels from Canada to the Santa Maria Refinery rail terminal. The distance travelled outside of California was not reported, but is estimated to be about 1500 miles. The distance within California, on the longest route, is estimated as 300 miles one way. SMR Rail Spur Project RDEIR, p. B-9. Thus, about 17% of the 30 ton/day of ROG would be emitted in California or about 5 ton/day of ROG (10,000 lb/day) can be emitted within California from rail car leakage.[48] Of the 300 miles within California, 67 miles are within the boundary of the SLOCAPCD via the northern route. SMR Rail Spur Project RDEIR, p. B-9. Thus, 1.1 ton/day (2,200 lb/day) of ROG emissions can be emitted within the SLOAPCD from rail car leakage.[49] These daily emissions greatly exceed the SLOCAPCD daily ROG+NOx CEQA significance threshold of 25 lb/day (RDEIR, Table 4.3-17), requiring additional mitigation not identified in the RDEIR. These ROG emissions could be reduced by modifying the rail cars before they are shipped to minimize or eliminate leakage.

These ROG emissions contain the same chemicals found in the crude oil, including benzene, toluene, ethylbenzene, and xylene (collectively "BTEX") and hexane. Some crudes can contain up to 7% benzene by weight. Thus, greater than 154 lb/day of benzene could be emitted in California from rail car leakage. This rail car leakage is much greater than the amount of benzene (and other TACs) included in the SMR Rail Spur Project RDEIR's health risk assessment.

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[46] Chapter 11. Tank Car Operations, Available at: http://www.globalsecurity.org/military/library/policy/army/fm/10-67-1/CHAP11.HTML.

[47] ROG emissions from train transit = (106 ton/car)(80 car/train)(5 train/week)(0.005)/(7 days/week) = **30 ton/day.**

[48] ROG emitted within California = (30 ton/day)(300/1500+300) = **5 ton/day.**

[49] ROG emitted within SLOCAPCD = (30 ton/day)(67/1500+300) = **1.1 ton/day.**

IV. THE SMR RAIL SPUR PROJECT RDEIR DID NOT EVALUATE THE INCREASE IN RISK OF ACCIDENTS AT THE SANTA MARIA REFINERY

The SMR Rail Spur Project RDEIR includes a brief discussion of the impact of changes in crude slate on hazards at the Refinery, designated as Impact #HM.3. SMR Rail Spur Project RDEIR pp. 4.7-63 and 4.7-65. This discussion touches on naphthenic acid corrosion, pointing to various inspection programs and ultimately dismissing corrosion-related accidents because "... the expected range of sulfur and TAN would be within the range of the crudes that are currently being processed at the SMR. Therefore, the change in crude slate would not be expected to change the sulfur or TAN levels compared to the crude sources that are currently being processed at the SMR." SMR Rail Spur Project RDEIR, Table 4.7-14 and p. 4.7-66. This is an inadequate discussion and the conclusions are wrong for several reasons.

First, corrosion failures in refineries are of great concern because of the high likelihood of "blowout" or catastrophic failure of components. This can happen because corrosion occurs at a relatively uniform rate over a broad area, so a pipe can get progressively thinner until it bursts, rather than leaking at a pit or local thin area that could be found during visual inspections. The process fluids carried in these lines are often above their auto-ignition temperature, resulting in large fires. They also usually carry toxic and hazardous materials, such as sulfur compounds (hydrogen sulfide, mercaptans, benzene) that can lead to toxic clouds, which can have significant adverse effects on surrounding communities.

Second, as background, it is important to recognize that the Rail Spur Project is proposing to replace the **majority** of the current crude slate (38,100 bbl/day) with up to 100% tar sands crudes. The Project proposes to import 37,142 bbl/day of cost-advantaged crudes by rail. SMR Rail Spur Project RDEIR, p. 2-23. Thus, the Project would replace 97% of the baseline crude slate with up to 100% tar sands crude. The SMR Throughput Increase Project will increase the crude permit level to 48,950 bbl/day. SMR Throughput Increase Project FEIR, p. 1-1. Thus, at full buildout, up to 76% of the crude slate will be different crudes than in the baseline, potentially 100% tar sands crudes.

Third, tar sands crudes have high Total Acid Numbers (TAN),[50] which indicates high organic acid content, typically naphthenic acids. Naphthenic acid attack occurs primarily in crude units and vacuum units, such as those at the SMR. SMR Rail Spur Project RDEIR, Fig. 2-10. They also form sludge and gum which can block pipelines and pumps. However, some acids are relatively inert. Thus, the TAN number does not always represent the true corrosive properties of a crude oil. Further, different acids will react at different temperatures, making it difficult to determine which processing units may be affected. As a rule-of-thumb, crude oils with a TAN number greater than 0.5 mg KOH/g are considered to be potentially corrosive and indicates a level of concern. A TAN number greater than 1.0 mg KOH/g is considered to be very high.[51] Canadian tar sands crudes are very high TAN crudes. The DilBits,

[50] The Total Acid Number measures the composition of acids in a crude. The TAN value is measured as the number of milligrams (mg) of potassium hydroxide (KOH) needed to neutralize the acids in one gram of oil.

[51] Margaret Sheridan, California Crude Oil Production and Imports, Staff Paper, California Energy Commission, April 2006, p. 6; Available at: http://www.energy.ca.gov/2006publications/CEC-600-2006-006/CEC-600-2006-006.PDF.

for example, range from 0.98 to 2.42 mg KOH/g.[52] The Project is proposing to import crudes at the upper end of this range (SMR Rail Spur Project RDEIR, Table 4.7.14), far above the level of concern and far above the "typical crude blend" refined at SMR in the baseline. SMR Rail Spur Project RDEIR, Table 4.7-14. Thus, the RDEIR should have included a detailed analysis of the corrosion potential of the proposed crude slate and imposed mitigation.

Further, while the industry benchmark for TAN corrosion is 0.5, crudes with lower TANs can still cause significant corrosion problems, depending upon the specific acids. Sweet low TAN crudes, such as those currently flooding the market, and which could be imported by the Rail Spur Project, are also known to cause TAN corrosion.[53] The SMR Rail Spur Project RDEIR is silent on corrosion issues related to these crudes.

Fourth, each crude has its own unique characteristic chemistry and thus effects on corrosion. Refineries that process a consistent diet of a particulate crude or crude blend can base future predictions of corrosion potential on past experience. However, when a major switch in crude slate occurs, as proposed here, predicting future corrosion based on historic operating ranges or "typical crude blends", as in the SMR Rail Spur Project RDEIR, is not reliable. A new slate, even when major lumper parameters are in the historic range, minimizes the accuracy, or even the feasibility of predictions based on historic data.[54]

The rationale that sulfur levels and TAN of the crude slate would stay within the reported range and thus corrosion is not an issue, ignores the possibility of gradual creep in both sulfur and TAN within the usual range that could still be significant. The SMR Rail Spur Project RDEIR, for example, concedes that the new crude slate would increase sulfur by 0.8%. SMR Rail Spur Project RDEIR, p. 4.3-46. From a corrosion standpoint, this is a significant increase. The SMR Rail Spur Project RDEIR did not discuss the impact of a 0.8% increase in sulfur on corrosion-induced accidents at the SMR.

The high proportion of tar sands crudes in the future crude slate renders the ranges in SMR Rail Spur Project RDEIR Table 4.7-14 as irrelevant for concluding that the new crudes fall within the range of historic crudes. For example, if 100% Peace River Heavy[55] were refined, both its average sulfur and TAN level would exceed the sulfur (5.0%>4.2%) and TAN (2.5>1.0 mg KOH/g) concentrations in the baseline "typical crude blend." In fact, even the lower end of the reported range of sulfur and TAN in Peace River Heavy would exceed the "typical crude blend." The fact that the sulfur and TAN of Peace River Heavy falls within the reported ranges (S: 2.1 to 5.2%; TAN: 0.4-4.0 mg KOH/g) is simply irrelevant, as the SMR did not operate, on average, at the upper end of the range. Because the sulfur and TAN data for

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[52] www.crudemonitor.ca.

[53] M.J. Nugent, J.D. Dobis, Experience with Naphthenic Acid Corrosion in Low TAN Crudes, Corrosion 98, Paper No. 577

[54] See discussion in API Recommended Practice 939-C, Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failure in Oil Refineries, First Edition, May 2009.

[55] Access Western Blend (TAN: 1.69-1.85 mg KOH/g; S: 3.94-3.96%); http://www.crudemonitor.ca/crude.php?acr=AWB and Peace River Heavy (TAN: 2.42 to 2.58 mg KOH/g; S: 4.94 to 5.08%); http://www.crudemonitor.ca/crude.php?acr=PH.

these tar sands crudes exceed the "typical crude blend" by significant amounts, corrosion impacts are significant and should have been disclosed, analyzed, and mitigated.

Fifth, the SMR Rail Spur Project RDEIR did not discuss or even mention sulfidation corrosion, which is a concern for refineries such as SMR, built in 1955 before current American Petroleum Institute (API) standards were developed to control corrosion and before piping manufacturers began producing carbon steel in compliance with current metallurgical codes. Rather, it notes in passing that "[h]igh sulfur levels can lead to sulfide related corrosion." SMR Rail Spur Project RDEIR, p. 4.7-65.

The early construction date suggests the metallurgy used throughout much of the SMR may not be adequate to handle the unique chemical composition of tar sands crudes without significant upgrades. There is no assurance that required metallurgical upgrades would occur if tar sands crudes dominate the crude slate, as they are very expensive and are not required by any regulatory framework. Experience with changes in crude slate at the Chevron Refinery in Richmond in the San Francisco Bay Area suggest required metallurgical upgrades are ignored, leading to catastrophic accidents.[56]

Sulfidation corrosion generally occurs above about 500 F for carbon steel pipe and above about 600 F for 5 Cr low-alloy steel. Some sulfide species are more corrosive than others, including mercaptans, hydrogen sulfide, and disulfides, all of which occur at elevated levels in tar sands crudes. Sulfidation corrosion manifests as uniform thinning and thus cannot be detected from visual inspections. Low silicon carbon steel can corrode 2 to 10 times faster than higher silicon carbon steel.[57]

How much low silicon carbon steel piping is present at SMR? What impact will an admitted 0.8% increase in sulfur have on this piping? What sulfur compounds are present in the 0.8% increase in sulfur? The SMR Rail Spur Project RDEIR did not disclose either the specific suite of sulfur compounds in the proposed imports or the metallurgy and operating conditions in the units potentially susceptible to sulfidation corrosion. Thus, it fails as an informational document under CEQA.

A catastrophic blowout due to sulfur creep recently occurred at the Chevron Richmond Refinery near the Rodeo Refinery. This refinery gradually changed crude slates, while staying within its established crude unit design basis for total weight percent sulfur of the blended feed to the crude unit.[58] This change increased corrosion rates in the 4-sidecut line, which led to a

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[56] U.S. Chemical Safety and Hazard Investigation Board, Interim Investigation Report, Chevron Richmond Refinery Fire, Chevron Richmond Refinery, Richmond, California, August 6, 2012, Draft for Public Release, April 15, 2013; Available at: http://www.csb.gov/chevron-refinery-fire/.

[57] E.H. Niccolls, J.M. Stankiewicz, J.E. McLaughlin, and K. Yamamoto, High Temperature Sulfidation Corrosion in Refining, September 2008, 17th International Corrosion Congress, Corrosion Control in the Service of Society, Vol. 1 of 5, as cited in: Interim Investigation Report, Chevron Richmond Refinery Fire, August 6, 2012; Available at: http://www.csb.gov/assets/1/19/Chevron_Interim_Report_Final_2013-04-17.pdf.

[58] US Chemical Safety and Hazard Investigation Board, Chevron Richmond Refinery Pipe Rupture and Fire, August 6, 2012, p.34 ("While Chevron stayed under its established crude unit design basis for total wt. % sulfur of

catastrophic pipe failure in the #4 Crude Unit on August 6, 2012. This accident sent 15,000 people from the surrounding area for medical treatment due to the release and resulting fire that created huge black clouds of pollution billowing over the surrounding community and across the San Francisco Bay.[59]

The SMR has a similar crude unit, identified as the "crude tower" in SMR Rail Spur Project RDEIR Figure 2-10. These types of accidents can be reasonably expected to result from incorporating tar sands crudes into the Santa Maria Refinery crude slate, even if the range of sulfur and TAN of the crudes remain the same, unless significant upgrades in metallurgy occur, as these crudes have a significant concentrations of sulfur in the heavy components of the crude coupled with high total acid numbers (TAN) and high solids, which aggravate corrosion. A crude slate change could result in corrosion from, for example, the particular suite of sulfur compounds or naphthenic acid content, that leads to significant accidental releases, even if the crude slate is within the current design slate basis, due to compositional differences. The gas oil and vacuum resid piping, for example, may not be able to withstand naphthenic acid or sulfidation corrosion from refining 76% to 97% tar sands crudes, leading to catastrophic releases.[60]

Elevated levels of TAN and sulfur can cause accidents that result in catastrophic releases of air pollution. Such releases were not considered in the SMR Rail Spur Project RDEIR. Rather, the SMR Rail Spur Project RDEIR relies on the SMR's existing Process Safety Management program, including the Management of Change (MOC) and Mechanical Integrity (MI) programs, to prevent corrosion. SMR Rail Spur Project RDEIR, pp. 4.7-65/66. However, these programs were also in place at the Chevron Richmond Refinery (and many other similarly afflicted refineries) at the time of the August 2012 accident discussed above. They did not prevent a catastrophic accident caused by sulfur (or TAN) creep. The recent Chevron Refinery Modernization Project FEIR incorporated many additional mitigation measures to improve these programs,[61] which should be required for the Santa Maria Refinery to mitigate the increase in sulfur and TAN in crudes imported by the Rail Spur Project.

Refinery emissions released in upsets and malfunctions can, in some cases, be greater than total operational emissions recorded in formal inventories. For example, a recent investigation of 18 Texas oil refineries between 2003 and 2008 found that "upset events" were

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the blended feed to the crude unit, the sulfur composition significantly increased over time. This increase in sulfur composition likely increased corrosion rates in the 4-sidecut line.").

[59] U.S. Chemical Safety and Hazard Investigation Board, Interim Investigation Report, Chevron Richmond Refinery Fire, Chevron Richmond Refinery, Richmond, California, August 6, 2012, Draft for Public Release, April 15, 2013, Available at; http://www.csb.gov/chevron-refinery-fire/.

[60] See, for example, K. Turini, J. Turner, A. Chu, and S. Vaidyanathan, Processing Heavy Crudes in Existing Refineries. In: Proceedings of the AIChe Spring Meeting, Chicago, IL, American Institute of Chemical Engineers; New York, NY, Available at: http://www.aiche-fpd.org/listing/112.pdf.

[61] See, for example, Chevron Refinery Modernization Project, Revisions to Draft EIR Volumes 1 and 2, p. 4-40, Mitigation Measure 4.13-7h, Available at: http://chevronmodernization.com/project-documents/.

frequent, with some single upset events producing more toxic air pollution than what was reported to the federal Toxics Release Inventory database for the entire year.[62]

Catastrophic releases of air pollution from these types of corrosion-caused accidents were not considered in the SMR Rail Spur Project RDEIR and are significant. Mitigation should be imposed, including at least the following:

- All mitigation measures required in the Chevron Refinery Modernization Project FEIR;
- 100% component inspection of all carbon steel piping systems susceptible to sulfidation corrosion; and
- Modification of work processes for review of damage mechanisms for processes covered by the Process Safety Management standard to conform with the American Petroleum Institute Recommended Practice 571, Damage Mechanisms Affecting Fixed Equipment in the Refining Industry. The revised work processes shall require consideration of damage mechanism reviews as part of the Process Hazard Analysis process.[63]

V. RAIL ACCIDENTS WERE UNDERESTIMATED AND ARE SIGNIFICANT

The RDEIR evaluated "potential public safety and hazardous materials impacts" from train derailments and unloading accidents that could lead to fires and explosions. RDEIR, Sec. 4.7. Elsewhere, the RDEIR evaluates the impacts of derailments on water resources and biological resources. RDEIR, Secs. 4.4 & 4.13. These analyses are fundamentally flawed and incomplete, as explained below.

First, the RDEIR only analyzed impacts from the Roseville and Colton Rail Yards to the Project site. It did not analyzed impacts from the California border to these rail yards, arguing that trains could enter California at five different locations and thus the specific route was "speculative". RDEIR, pp. 4.7-1, 4.13-7. Routes are not "speculative" when they are known, as here. The trains can take any of them, depending on conditions. As they are known and any of these known routes can be taken, they are not speculative. The RDEIR should have evaluated all of them. Further, the trains can take multiple routes from the rail yards to the Santa Maria Rail Yard. The RDEIR, inconsistently, did not conclude that this rendered these routes speculative.

This is a serious omission as the segments from the state line to the rail yards pass through some of the state's most sensitive ecological areas and parallel the water supply for most of the state. These route segments also contain many high hazard areas for derailments.

[62] J. Ozymy and M.L. Jarrell, Upset over Air Pollution: Analyzing Upset Event Emissions at Petroleum Refineries, Review of Policy Research, v. 28, no. 4, 2011.

[63] Terms and Conditions of Probation, People v. Chevron U.S.A. Inc., Superior Court of the State of California, County of Contra Costa, Case No. 1-162745-4.

Emergency response teams have generally good coverage in the urban areas, but none are located near the high hazard areas in rural Northern California that the RDEIR did not analyze.[64]

Second, the RDEIR did not analyze a worst case derailment. The RDEIR assumed a worst-case spill of 180,000 gallons, or about six tanker cars. RDEIR, p. 4.7-47. No support was provided for this choice. Rail accident records should have been reviewed to select a worst-case spill. The July 2013 Lac-Mégantic derailment spilled about 1.6 million gallons of Bakken crude oil, or about 53 railcars, covering an area of 77 acres.[65] The RDEIR should have based its analysis on a spill of at least 1.6 million gallons.

Third, the RDEIR did not analyze the impacts of a derailment on the state's water supply, which originates in the northern portion of the state along the rail segments eliminated from its analysis as "speculative". The rail routes from the state line to the rail yards parallel major rivers, such as the Sacramento, Yuba, Feather and American Rivers, which supply most of the water used throughout the state, distributed by a complex system of reservoirs and pipelines operated by Central Valley Project and the State Water Project. A significant spill of crude oil into any of these rivers would potentially shutdown the water supply for a significant portion of the state. This would have catastrophic and far reaching consequences that the RDEIR does not acknowledge, let alone analyze.

Fourth, the RDEIR notes that when spilled, a DilBit will sink (RDEIR, 4.13-27), but the RDEIR fails to disclose the resulting consequences on water supply and biological resources. The RDEIR is also silent on the difficulty of cleaning up the spill. An oil pipeline burst near Marshall, Michigan in July 2010, spilling a million gallons of DilBit in the Kalamazoo River. This spill decimated Talmadge Creek, a tributary to the Kalamazoo River, and about 40 miles of the river, prompting a more than $1 billion cleanup that, four years later, is still under way.[66] While most conventional crudes float on water, most of the DilBit, the bitumen component, sinks and clings to bottom sediments. This submerged oil is significantly harder to cleanup. The Kalamazoo spill, which occurred in 2010, is still not cleaned up.[67] The RDEIR failed to disclose

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[64] Interagency Rail Safety Working Group, State of California, Oil by Rail Safety in California. Preliminary Findings and Recommendations, June 10, 2014.

[65] NTSB, Safety Recommendation In reply refer to: R-14-4 through -6; January 21, 2014. Available at: http://www.ntsb.gov/doclib/recletters/2014/R-14-004-006.pdf.

[66] Keith Matheny, Environmental Disasters Lurk in Energy Pipelines, Detroit Free Press, October 12, 2014, Available at: http://www.freep.com/story/money/business/michigan/2014/10/12/energy-environmental-threats/17046063/.

[67] A Dilbit Primer: How It's Different from Conventional Oil, Inside Climate News. Available at: http://insideclimatenews.org/news/20120626/dilbit-primer-diluted-bitumen-conventional-oil-tar-sands-Alberta-Kalamazoo-Keystone-XL-Enbridge?page=show; Lindsey Smith, 3 Years and Nearly $1 Billion Later, Cleanup of Kalamazoo River Oil Spill Continues, Michigan Radio, July 25, 2013, Available at: http://michiganradio.org/post/3-years-and-nearly-1-billion-later-cleanup-kalamazoo-river-oil-spill-continues; NOAA Office of Response and Restoration, As Oil Sands Production Rises, What Should We Expect at Diluted Bitumen (Dilbit) Spills?, Available at: http://response.restoration.noaa.gov/about/media/oil-sands-production-rises-what-should-we-expect-diluted-bitumen-dilbit-spills.html; Witt O'Brien, A Study of Fate and Behavior of Diluted Bitumen Oils on Marine Waters, November 2013, Available at: http://www.transmountain.com/uploads/papers/1391734754-astudyoffateandbehaviourofdilutedbitumenoilsonmarinewater.pdf

the difficulty of cleaning up a large spill in one of California's headwater rivers that supply California's municipal, industrial, and agricultural water.

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November 24, 2014

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VIA EMAIL
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cc: mwilson@co.slo.ca.us

RE: Comments on the Revised Draft Environmental Impact Report for the Phillips 66 Company Rail Spur Extension and Crude Unloading Project

Dear Mr. Wilson,

Phillips 66 now admits that this is a tar sands crude by rail project. Nevertheless, the Revised Draft Environmental Impact Report ("RDEIR") for the Phillips 66 Rail Spur Extension and Crude Unloading Project ("Project") still fails to correct several deficiencies of the prior draft report, and fails as an informational document under the California Environmental Quality Act ("CEQA") for the additional reasons explained herein.

The Project Description remains inadequate in not fully addressing the scope of the company's total shift to a different quality of crude oil feedstock, and the RDEIR still obscures the inextricable link between the projects at the Santa Maria and Rodeo facilities. This, among other deficiencies, hides the true scope of the Project and precludes any adequate analysis of significant impacts.

The Santa Maria facility is the "front end" of the Phillips 66 San Francisco Refinery ("SFR"). The facility performs severe processing of oil streams that are then piped to the SFR's Rodeo facility to make into profitable engine fuels. This Project switches the SFR to refining tar sands oil. This rail expansion allows the company to get tar sands "dilbit" oils by rail, which the throughput increase allows it to convert into engine fuel feedstocks for the Rodeo facility. At

Rodeo, a liquefied petroleum gas expansion requires this change in oil processing, and allows some resultant byproducts, otherwise uneconomic to dispose of, to be recovered and sold.[1] The RDEIR's environmental review is, however, unnecessarily limited to primarily rail transport activities, with a wholly inadequate assessment of impacts and mitigation in light of its unpersuasive assertions of federal preemption. Overall, the RDEIR hides serious local pollution, climate pollution and chemical safety hazards from the public and its own workers. Accordingly, on behalf of Communities for a Better Environment, the Sierra Club, the Center for Biological Diversity, and Forest Ethics, we respectfully submit this comment, supported by several community based organizations and groups, cities, the California Nurses Association and thousands of California residents, seeking adequate environmental review of the Project, which is not reflected in the RDEIR. In addition, to date, approximately 22,000 residents have actively voiced concern against this Project.

Communities for a Better Environment ("CBE") is a California nonprofit environmental health and justice organization with offices in Oakland and Huntington Park. CBE has extensive organizational experience in protecting and enhancing the environment and public health by reducing pollution and minimizing hazards from refinery operations.

Sierra Club is a national nonprofit organization of over one million members and supporters dedicated to exploring, enjoying and protecting the wild places of the earth; practicing and promoting responsible use of the earth's ecosystems and resources; educating and enlisting humanity to protect and restore the quality of the natural and human environment; and using all lawful means to carry out these objectives. Sierra Club's Beyond Oil Campaign works to stem our nation's dependence on oil and to secure protections for communities and ecosystems from the significant toxic and global warming pollution emitted by oil development, including prevention of oil spills and other catastrophic events and pollution emissions that result from transporting extreme forms of oil by rail. Sierra Club has more than 143,000 members in the State of California who want to ensure that California's treasured landscape and coastline through which oil would be transported by rail are protected into the future.

The Center for Biological Diversity ("Center") is a non-profit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 800,000 members and online activists throughout California and the United States, including members that live and/or visit the vicinity of the proposed project. These comments are submitted on behalf of our board, staff and members.

ForestEthics is a U.S. nonprofit organization that demands that corporations and government protect community health, the climate, and our wild places. ForestEthics fights to stop dangerous extreme oil trains and pipelines and has secured the protection of 65 million acres of wilderness by pushing major companies to shift hundreds of millions of dollars to responsible purchasing. ForestEthics has over 14,000 supporters in California.

As set forth below and in Attachments A-F, which include the expert reports of Phyllis Fox, Ph.D., PE ("Fox Revised Santa Maria Report," Attachment C), and Greg Karras ("Karras Revised Santa Maria Report," Attachment B), the RDEIR suffers from numerous deficiencies

[1] The Phllips 66 Rail Spur Extension and Crude Unloading, Throughput Increase, and Propane Recovery Projects.

that render it inadequate under the California Environmental Quality Act[2] ("CEQA") and the CEQA Guidelines[3] ("CEQA Guidelines"). We respectfully request that the County reject the RDEIR as an environmental review document, and defer approval of the Project until such time as the RDEIR is revised to comply with CEQA, which includes following the procedures detailed in section I addressing lead agency review of piecemealed projects.

An EIR is "the heart of CEQA."[4] "The purpose of an environmental impact report is to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment; to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project."[5] The EIR "is an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return. The EIR is also intended 'to demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its action.' Because the EIR must be certified or rejected by public officials, it is a document of accountability."[6] The RDEIR for the proposed Project still fails entirely to live up to this mandate, therefore, it violates CEQA, and violates several principles of Environmental Justice.

I. ENVIRONMENTAL REVIEW SHOULD PROCEED UNDER A PROGRAM EIR.

"A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one larger project."[7] Emphasized throughout this comment, the Project is piece-mealed and cannot achieve its objective independently, without either the Throughput Increase or Rodeo Propane Recovery projects.

As the Project is part of "one larger project," it would be more appropriate to analyze it under a Program EIR. This has several advantages: providing a more exhaustive consideration of effect and alternatives than would be practical in an EIR, ensuring adequate consideration of cumulative impacts that "might be slighted in a case-by-case analysis," allowing for an earlier and more practical consideration of mitigation measures, and saving considerable agency resources.[8]

Where there could be more than one lead agency, as in this case, the lead agency which acts first on the project shall be the lead agency.[9] On June 8, 2010, the County of San Luis Obispo Planning and Building Department issued the Notice of Preparation for the Refinery Throughput Increase Project. On July 24, 2012, the Contra Costa County Department of Conservation and Development issued a Notice of Preparation and Scoping Session for an EIR for the Phillips 66 Propane Recovery Project. On July 8, 2013, the County of San Luis Obispo

[2] Pub. Res. Code § § 21000 *et seq.*
[3] 14 Cal. Code Regs. § § 15000 *et seq.*
[4] *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal. 3d 376, 392 ("*Laurel Heights I"*).
[5] Pub. Res. Code § 21061
[6] *Laurel Heights I*, 47 Cal. 3d at 392 (citations omitted).
[7] CEQA Guidelines § 15168.
[8] *Id.*
[9] CEQA Guidelines § 15051.

Planning and Building Department issued the Notice of Preparation for the Rail Spur Project. The County of San Luis Obispo Planning and Building Department acted first with the first component of this project, the Throughput Increase project, and is therefore the appropriate lead agency for a program EIR.

Consequently, pursuant to the CEQA Guidelines, it would benefit the County to withdraw this RDEIR and move forward under a programmatic EIR approach. This would also yield a more accurate assessment of the significant and cumulative impacts and mitigation measures for all communities affected by the SFR's switch to refining tar sands.

II. THE EIR'S PROJECT DESCRIPTION IS INADEQUATE.

A. The Project Description Fails to Disclose an Industry Shift to a Different Quality Crude Feedstock

In order for an environmental document to adequately evaluate the environmental ramifications of a project, it must first provide a comprehensive description of the project itself. "An accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR."[10] As a result, courts have found that, even if an EIR is adequate in all other respects, the use of a "truncated project concept" violates CEQA and mandates the conclusion that the lead agency did not proceed in a manner required by law.[11]

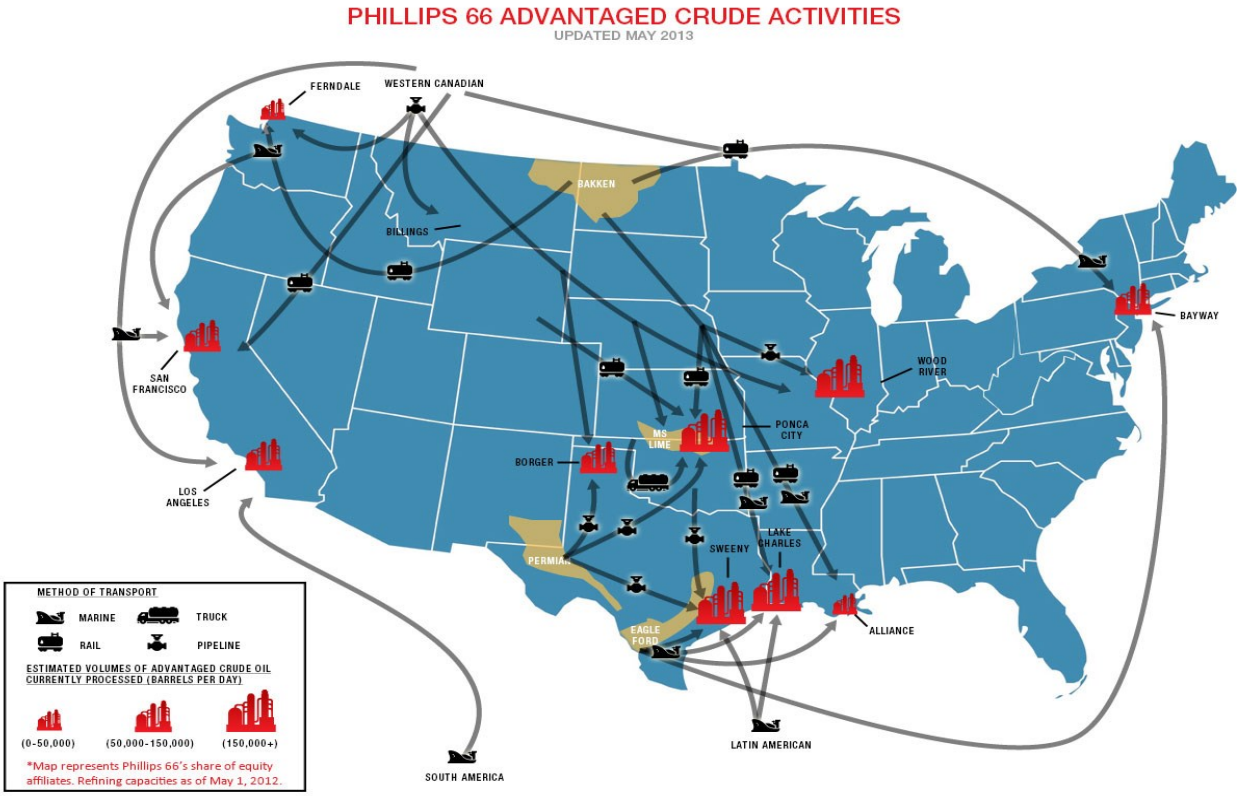
Furthermore, "[a]n accurate project description is necessary for an intelligent evaluation of the potential environmental effects of a proposed activity."[12] Thus, an inaccurate or incomplete project description renders the analysis of significant environmental impacts inherently unreliable. While extensive detail is not necessary, the law mandates that EIRs should describe proposed projects with sufficient detail and accuracy to permit informed decision-making.[13] The RDEIR's Project Description fails to meet this standard by minimizing the degree and scope of the switch in crude oil feedstock supply.

The RDEIR's Project Description is misleading. From the outset, the RDEIR limits its Project and Project-related impacts analyses solely on the Project's rail operations. However, this is not simply a transport infrastructure project. The RDEIR instead states that the primary objective of the project is to "allow the refinery to obtain…crude oil…from…North American sources that are served by rail…(by) install(ing) the necessary infrastructure."[14] The RDEIR's avoidance of this fact diminishes the true intent and scope of the Project, which is, in reality a project to receive tar sands. Indeed, this Project expressly enables and locks in refining of tar sands at the SFR: "tar sands oils would likely dominate the new crude source."[15]

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[10] *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal. App. 4th 713, 730, quoting *County of Inyo v. City of Los Angeles* (1977) 71 Cal. App. 3d 185, 193.
[11] *Id.* at 730.
[12] *Id.* (citation omitted).
[13] *See* CEQA Guidelines, §15124 (requirements of an EIR).
[14] RDEIR at 2-1.
[15] Karras Revised Santa Maria Report, at 3.

Phillips 66 is currently in the process of implementing a series of projects to allow a switch to refining what its management, and now also the RDEIR, calls, "advantaged crude." The company emphasizes: "(the) opportunity that we have…is to get…Canadian crudes down into California…We're looking at rail to barge to ship, down to the West Coast refineries..."[16] The map immediately below details this strategy.



Phillips 66 map indicating plans to transport Western Canadian crude oil to San Francisco Refinery.[17] Notice that the icon labeled "San Francisco" identifies the San Francisco Refinery, which includes the Santa Maria facility.

The company has no choice but to seek such an alternative supply of crude oil feedstock. As stated in the RDEIR:

> In the long-term, the need for the SMR rail project could be driven by declines in local production of crude oil that can be delivered by pipeline. Production from offshore Santa Barbara County (OCS crude) has been in decline for a number of years. Oil production in Santa Barbara County (both onshore and offshore) peaked at about 188,000 barrels in 1995 (County of Santa Barbara Energy Division website) and currently production is

[16] September 12, 2013 Transcript, pdf 7, available at: http://www.phillips66.com/EN/investor/presentations_ccalls/Documents/Barclays_091213_Final.pdf.
[17] Phillips 66 Advantaged Crude Activities: Updated May 2013, available at: http://www.phillips66.com/EN/Advantaged%20Crude/index.htm.

around 61,000 barrels per day for both onshore and offshore oil fields (BOEM Pacific Region and Drilling Edge websites).[18]

This decline in locally available crude stands in stark contrast to the Santa Maria facility's recent Throughput Expansion that enables the Santa Maria facility to process more crude oil. Certainly, the RDEIR makes a bold assertion: "Phillips 66 expects to continue to receive, blend and process a comparable range of crudes in the future."[19] At the same time, however, those diminishing local sources make up the "bulk" of the crude oil currently processed at the Santa Maria Refinery.[20]

As noted in one expert report, "built to tap local oil fields, the Santa Maria facility lacks infrastructure to receive crude via ship or rail. A pipeline system that connect the Santa Maria facility only to local oil fields "is currently the only way that the Phillips 66 refinery can receive crude oil.""[21] There is substantial evidence that declining local and regional crude production could greatly affect the operation of the Santa Maria facility.[22] If the facility's crude rate falls too far below the design specifications of its existing equipment, it cannot operate efficiently or profitably.[23] A more accurate project description must admit that the company is *replacing* one feedstock with another.

The distinction in crude oil feedstock matters. The chemical composition of raw materials that are processed by a refinery directly affect the amount and composition of the refinery's emissions.

> The amount and composition of sulfur in the crude slate, for example, ultimately determines the amount of [sulfur dioxide] that will be emitted from every fired source in the refinery and the amount of odiferous hydrogen sulfide and mercaptans that will be emitted from tanks, pumps, valves, and fittings. The composition of the crude slate establishes the CEQA baseline against which impacts must be measured.[24]

Other significant impacts, such as increased energy consumption, air emissions, toxic pollutant releases, flaring and catastrophic incident risks, are also entirely dependent on the quality of crude oil processed at the facility.[25] As detailed further below, a heavier crude oil feedstock has also been identified as a contributing factor to potentially catastrophic incidents at refineries, and a root cause of the August 6, 2012 fire at the Chevron Richmond Refinery.[26]

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[18] RDEIR at 2-36.
[19] *Id.* at 2-33.
[20] *Id.* at 2-35.
[21] Karras Revised Santa Maria Report at 4, citing RDEIR at 2-36.
[22] *Id.* at 5.
[23] *Id.*
[24] Fox Rodeo Report at 13.
[25] *See* Fox Rodeo Report, Fox Valero Report and Karras Rodeo Report at 11-13.
[26] *See* Chemical Safety Board, Chevron Richmond Refinery Interim Investigation Report, April 2013, available at: http://www.csb.gov/assets/1/19/Chevron_Interim_Report_Final_2013-04-17.pdf.

Any environmental review document for this Project must analyze the full scope of these impacts, and at least for the anticipated life of the project. A shift of this extent has far different consequences and impacts compared to the RDEIR's diminished purpose of merely "obtaining" these feedstocks or "continu[ing] to receive, blend and process a comparable range of crudes in the future."[27] The RDEIR insists, "it is speculative as to what if any local crude oil would be displaced." No such speculation is required:

> "…our plan promises…availability and supplies in North America…we're disappointed in the progress to permit our Santa Maria rail rack 40,000 a day, but we have – we're optimistic that we'll get that done. It just takes time in California to get these things permitted…we're making progress in terms of put advantaged crude to the front of our refineries in California."[28]

The company has expressed a clear priority to switch to refining tar sands at the SFR, a priority diminished by the RDEIR focus on merely transportation infrastructure. In fact, the Project is proposing to replace the **majority** of the current crude slate (2010-2012: 38,100 bbl/day) with up to 100% tar sands crudes.[29] Consequently, the DEIR's omission of this switch to a very different crude oil feedstock violates CEQA in leaving several significant impacts unanalyzed.[30] It is impossible to provide any intelligent evaluation of the potential environmental effects and risks to community and worker health and safety of partially refining Canadian tar sands in Santa Maria, unless the RDEIR *first* discloses the extent of the replacement of feedstock that the Project enables.[31] At a minimum, the RDEIR should have established how this Project would affect the scope and degree of the company's use of tar sands in Santa Maria and Rodeo and evaluate its resulting impacts.[32] The RDEIR should also states whether, and by at least an estimated degree how much, the current 2-7% of heavy Canadian crude oil suggested by the RDEIR to be tar sands and processed at the Santa Maria Refinery would increase. Indeed, the percentage lies at the other end of the spectrum, reflecting the "long-term replacement of declining local SMF crude supplies."[33] Until such adequate disclosure occurs, the Project Description is inaccurate, incomplete and renders the analysis of significant environmental impacts inherently unreliable.[34]

B. The Project Is Piecemealed.

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[27] RDEIR at 2-33.

[28] *See* Phillips 66 Presentation to Barclays CEO Energy Power Conference, September 2014, *available a*t http://investor.phillips66.com/files/doc_presentations/2014/PSX-BarclaysCEOConfTransSept2014.pdf

[29] Fox Revised Santa Maria Report at 12.

[30] *See Berkeley Keep Jets Over the Bay Comm. v. Bd. of Port Comm'rs* (2001) 91 Cal.App.4th 1344, 1355 ("the failure to include relevant information precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals of the EIR process").

[31] *See Id*., see *also, Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4 70, 89 (holding that an EIR is insufficient where it obscures the project's enabling of a refinery to process heavier crude).

[32] *Id*.

[33] Karras Revised Santa Maria Report at 7.

[34] *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 722 (the failure to include relevant information relating to a project's components precludes informed decision making, thwarting the goals of the EIR) and *see* Karras and Fox Revised Santa Maria Reports.

Phillips 66's Santa Maria and Rodeo refineries are interdependent. One cannot function without the other. If major reconfigurations occur at both facilities at the same time and those modifications require each other, then they must be part of the same project. CEQA requires that an EIR describe the entirety of a project, including reasonably foreseeable future actions that are part of it.[35] Illegally "chopping a large project into many little ones" creates a narrow view of a project and "fallacy of division…that is, overlooking a project's cumulative impact by separately focusing on isolated parts of the whole."[36] Certainly, any permit by permit review, where those permits constitute a larger project, forecloses this essential focus on cumulative impacts, and also, impacts to already overburdened and vulnerable populations.

In *Laurel Heights I*, the Supreme Court established the following test: while an EIR need not include speculation about future environmental consequences of a project, the "EIR must include an analysis of the environmental effects of future expansion or other action if: (1) it is a reasonably foreseeable consequence of the initial project; and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effect."[37] Under this standard, "the facts of each case will determine whether and to what extent an EIR must analyze future expansion or other action."[38] A project proponent must analyze future expansion and other such action in an EIR if there is "telling evidence" that the agency has either made decisions or formulated reasonably definite proposals as to such future activities.[39] Further, there must be discussion "in at least general terms" of the future activity, even if the project is contingent on uncertain occurrences.[40]

This rail spur expansion project wholly depends on both the throughput expansion project and the critical back end of the SFR, the Phillips 66 Rodeo Refinery. The SFR consists of two facilities linked by a 200-mile Phillips-owned pipeline. The Santa Maria facility is located in Arroyo Grande, in San Luis Obispo County, while the Rodeo facility is located in Rodeo, in Contra Costa County. As the Draft EIR noted, "the Santa Maria Refinery and the Rodeo Refinery, linked by the company's own pipeline, comprise the San Francisco Refinery…Semi-refined liquid products from the Santa Maria Refinery are sent by pipeline to the Rodeo Refinery for upgrading into finished petroleum products."[41] The refining processes at Phillips 66's Santa Maria and Rodeo facilities are integrated to a capacity that neither can achieve alone.[42] Further, Phillips 66 reports these two facilities as a single processing entity, the San Francisco Refinery, to industry and government monitors.[43]

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[35] CEQA Guidelines § 15378(a).
[36] *See* Bozung v. Local Agency Formation Commission , 13 Cal. 3d 263, 268 (1975) and McQueen v. Board of Directors of the Mid-Peninsula Regional Open Space District, 202 Cal. App. 3d 1136, 1143 (1988).
[37] *Laurel Heights I*, 47 Cal. 3d at 394-396.
[38] *Id.* at 396.
[39] Id. at 396-397.
[40] *Id.* at 398.
[41] DEIR at 2-3. Notably, the reference to the company ownership of the pipeline has been obscured in the RDEIR.
[42] *See* Karras Report on Phillips 66 Propane Recovery Project, September 2013, Exhibits 21 through 24. *Oil & Gas Journal*, 2012; and EIA Ref. Cap. 2013. See also orders R2-2011-0027 and R3- 2007-0002. Comparing the references shows "Rodeo" capacities reported to EIA include the Santa Maria facility, attached as part of Attachment A.
[43] *Id.*

The RDEIR's piecemealing of both ends of the same refinery is analogous to the facts of *Laurel Heights I*. In that case, the Supreme Court set aside an EIR for piecemealing the reasonably foreseeable second phase of a multi-phased project. The University of California, San Francisco, had proposed a project to expand into a new building, of which only about a third was initially available to the school. The EIR failed to analyze impacts related to occupying the remaining two thirds, even though it was wholly foreseeable that UCSF would occupy the entire building.[44] Here, Phillips 66 will obtain tar sands crude by rail, must eventually fully refine it for sale, and to do so requires the entire SFR, not only the Santa Maria or Rodeo facilities. Just as it was foreseeable for the University of California to occupy the whole building, it is at least equally foreseeable, if not a surety, that the Rodeo facility will fully refine tar sands imported to the Santa Maria facility.

In order for Phillips 66 to implement its "advantaged crude" strategy for the SFR, it requires three pieces: the Santa Maria Refinery Throughput Increase Project, the Rodeo Refinery Propane Fuel Recovery Project, and this Project. Imports of heavy Canadian tar sands are facilitated by the Throughput Increase project. Components of the Rodeo Propane Fuel Recovery Project lock the Rodeo Refinery into a change in oil feedstock processing tar sands anticipated by rail to the Santa Maria Refinery.[45] That lower quality feedstock, gas oils and naptha, is produced at Santa Maria and sent to Rodeo by pipeline, a pipeline owned by the same company.[46] These changes are inter-related, wholly anticipate each other, and together create significant impacts on the environment. This meets the two-part *Laurel Heights I* test and is far removed from court decisions that do not find a piecemealed project on account of an insufficient showing of this "necessity" element.[47]

The following analysis further highlights a larger project that is piecemealed and more appropriate for review under a programmatic level EIR.

(i) The Prior Throughput Expansion is Dependent on this Project.

In the *San Joaquin Raptor* case, the court held that the EIR for a residential development project was invalid because it failed to discuss expansion of the sewer system, even though the developer recognized the necessity for sewer expansion for the overall development project to

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[44] *Laurel Heights I*, 47 Cal.3d at 393.
[45] *See* Karras and Fox Rodeo Reports and RDEIR at 2-32 (Fox Rodeo Report also attached as part of Attachment A).
[46] *Id.* and DEIR at 2-29.
[47] In *Communities for a Better Environment et al. v. City of Richmond et al.*, (184 Cal. App. 4th 70, 100-101 (2010)), the Court of Appeal addressed the piecemealing issue with respect to another refinery expansion project. In that case, the EIR for the expansion project identified the potentially significant cumulative impact of a hydrogen pipeline project, but did not provide a complete analysis of the pipeline project's impacts. The Court held that the pipeline project was not piecemealed, that it is a separate project from the overall expansion project. In so holding, the Court reasoned that the expansion and pipeline projects are independent – they perform *entirely different* functions. The Court focused on project objectives: the expansion project's objective was to access a wider range of crude oil and other feedstocks; the pipeline project's objective was to transport excess hydrogen, not required by the expansion project, to other hydrogen consumers in the Bay Area. Ultimately, the Court found that the expansion project did not "depend on" the pipeline project. Similarly, in *Berkeley Jets*, the Court rejected an argument that an airport development plan should have included "long-range plans for potential runway expansions." The Court held that these future expansion plans were neither a crucial element nor a foreseeable consequence of the development plan. (*Berkeley Keep Jets Over the Bay Comm. v. Board of Port Cmrs.*, 91 Cal. App. 4th 1344, 1361 (2010)).

proceed.[48] The RDEIR's assertions that the throughput expansion project is unrelated and not dependent on the Rail Spur Project are misleading and incorrect.[49] This Project wholly supports the throughput expansion. Just as in *San Joaquin Raptor*, the company has identified a necessity to respond to declining local crude supplies. This calls into question any initial need, without the ability to obtain crude by rail, to increase throughput capacity.

The Santa Maria throughput increase project increases, "…the volume of products leaving the Santa Maria facility for the Rodeo Refinery via pipeline."[50] Nevertheless, the RDEIR still maintains that, "the ability of the Santa Maria Refinery to operate at the maximum approved throughput level is based on the existing infrastructure and is not dependent on, or related to, the SMR Rail Project."[51] Yet, the RDEIR then admits that, "the bulk" of local crude oil sources is declining, and in the long term, could "drive" this rail spur project.[52] This begs the simple question: if local supply is declining, how can the Santa Maria Refinery operate at the maximum capacity, when it currently operates below capacity, independent of rail assisted imports? Trucking in crude is expensive. There is simply no way for the Santa Maria facility to obtain enough crude oil feedstock for its throughput expansion economically without any crude imports by rail, implicating this Project's rail spur extension. The need for this Rail Spur Project was, therefore, wholly foreseeable at the inception of the Throughput Increase Project.

Furthermore, the environmental review of this Project overlaps with the Throughput Expansion explicitly in two regards. First, the evaluation of several project impacts is based on not only the same analysis and data performed in the Throughput Increase Project EIR, but the actual conclusions of that EIR.[53]

Second, the inclusion of the Vertical Coastal Access component is particularly telling. In *Tuolumne County*, the Court found projects A and B piecemealed where project B's approval was a condition of approval of project A.[54] As a condition of approval of the Throughput Increase Project, Phillips 66 was required to provide a vertical public right of coastal access at the Santa Maria facility.[55] The RDEIR includes a programmatic environmental assessment of the Vertical Coastal Access requirement: approval of this rail spur extension project would also mean approval of the vertical coastal access condition. This echoes the facts of *Tuolumne County*. Evidently, the public must also be protected from the rail transport of hazardous materials, as well as the facility's partial refining and storage of those same hazardous materials. Not only was the need for the rail spur clearly foreseeable at the time of the throughput expansion, but the linked projects also implicate greater and significant environmental impacts of transporting and refining tar sands at the SFR. The two projects are piecemealed and integral to this greater design.

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[48] San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus, 27 Cal.App.4th 713, 729 (1994).
[49] *See eg.* DEIR at 2-29.
[50] S*ee* Fox Rodeo Report at 6, citing Throuput Project DEIR at ES-4, 2-25.
[51] RDEIR at 2-35.
[52] RDEIR at 2-32, 2-36.
[53] *See eg.* Tables 4.3.6, 4.3.7, 4.3.26.
[54] *Tuolumne County*, 155 Cal. App. 4th at 1214.
[55] *See* RDEIR at ES-17.

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(ii) The Phillips 66 Rodeo Refinery is Dependent on this Project.

> "Tar sands crudes are heavier and more viscous than the feedstock currently processed at either Rodeo or Santa Maria. These crudes are thus commonly blended with 25% to 30% diluent to facilitate transporting them by rail or pipeline. The blended crude is known as a "DilBit." The diluent is typically natural gas condensate, pentanes, or naphtha. The diluent can be readily separated and recovered as propane/butane at Rodeo."[56]

The Santa Maria Refinery Throughput Increase and Rail Spur Extension projects are intricately related to the propane/butane recovery project currently proposed at the company's Rodeo Refinery. The Rodeo project recovers propane and butane from the refining of crude oil at both Rodeo and Santa Maria.[57] The throughput increase at Santa Maria would necessarily be included in the streams from which propane and propane/butane would be recovered at the Rodeo Refinery and this increase would have been anticipated when the propane/butane project was being planned as the Land Use Application for the Santa Maria throughput increase project was filed in 2008, well in advance of the propane/butane project at Rodeo, the application for which was filed in 2012. An increased throughput of tar sands would arrive at the Santa Maria facility by rail, be converted into semi-refined products in the Santa Maria facility's distillation units and coker to yield gas oil and naptha, which would then be sent to the Rodeo facility, where propane and butane would be separated, contributing to the propane/butane slated for recovery by the Rodeo Propane Recovery Project.[58]

In addition, the Throughput Increase Project anticipates a 10% increase in throughput capacity, and therefore butane and propane feedstocks.[59] Even with the throughput increase, a discrepancy between the amount of propane and butane projected and currently recovered still exists, and is quite large, perhaps explained by the company's anticipated recovery and use of propane and butane-rich diluent in Canadian tar sands crude.

> In fact, most all of the cost-advantaged crudes flooding into the market will allow the Santa Maria facility to produce propane/butane rich, semi-refined products and the Rodeo Refinery to recover more propane and butane from them than available in their baseline crude slates.[60]

Moreover, this implicates direct transport of tar sands crude from the Santa Maria facility to the Rodeo facility by pipeline. This possibility is not precluded by the RDEIR's assertion that, "no crude oil or refined product would be transported out of the refinery by rail."[61] Further,

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[56] Fox Rodeo Report at 7.
[57] *See* Karras and Fox Rodeo Reports and Karras and Fox Revised Santa Maria Reports.
[58] *Id.*
[59] Fox Rodeo Report at 6, citing Throughput Increase Project EIR.
[60] Fox Revised Santa Maria Report at 6.
[61] RDEIR at ES-5.

some tar sands crudes are classified as a semi-refined product,[62] and therefore not relevant to that assertion.

Another link between the import of tar sands dilbit oils at Santa Maria for processing and the Rodeo project involves solving the problem of the disposition of the diluent used to transport the bitumen in these dilbits. Generally, plants that, like Santa Maria's, are not configured to process light crude in any quantity may need to consider disposing of the (very light) diluent, which may, for example, simply be returned for reuse as diluent in future dilbit imports. While such a solution may be economic for pipeline delivery systems it could be quite costly, and hazardous, if the diluent is returned by rail. However, this same diluent is LPG-rich, and presents an opportunity to increase the amount of propane and butane that could be recovered at Rodeo.[63] Furthermore, the refining of dilbits yields much greater amounts of naphtha, "the lighter component of the pressure distillate sent to Rodeo and one of the feedstocks for propane recovery."[64] The Rodeo project, by allowing Phillips to recover and sell that (LPG) portion of the diluent, could significantly improve the cost structure of the "Advantaged Crude" strategy to be implemented by the Project.

The RDEIR attempts to provide information to contradict the interdependence of the two parts of the SFR. The RDEIR alleges that, as vapor "pressure limits (of tanks that store naphtha and gas oil) restrict the amount of propane/butane that can be contained in naphtha and gas oils," and, "additional butane and or propane would cause the products to exceed the vapor pressure limits of the storage tanks," suggesting that there is no link between this Project and the Rodeo project.[65] The RDEIR attempts to bolster this claim by asserting that it historically and currently operates near these limits, prohibiting any potential increased propane/butane transport to Rodeo.[66] These assertions, however, are incorrect and wrong.[67] Rather, there are either no such vapor pressure limits on the subject tanks, or the materials stored in them have a vapor pressure far below their permitted levels.[68] In addition, the RDEIR fails to contain any support whatsoever for these propositions, which cannot meet CEQA's threshold requirement of substantial evidence.[69] "In sum, the claims made in the RDEIRs in an attempt to decouple the Santa Maria Rail Spur Project and the Rodeo Propane Recovery Project based on vapor pressure limits have no merit."[70]

Evidently, plenty of "telling evidence" exists regarding the intimate connection between the proposed Project, the Throughput Increase Project and the Propane Recovery Project. The facts are again analogous to *Laurel Heights I* and the *San Joaquin Raptor* case: the Rodeo Project depends on the projects at the Santa Maria Facility and vice versa. Consequently, these

[62] Fox Rodeo Report at 6.
[63] Fox Revised Santa Maria Report at 7.
[64] *Id*. at 8, citing RDEIR for the Propane Recovery Project at 3-6.
[65] *Id.* at 2.
[66] *Id.*
[67] *Id.*
[68] *Id.*
[69] *Id.* at 3.
[70] *Id.* at 11.

are connected actions that must therefore be analyzed concurrently with the direct and cumulative impacts of the proposed Project itself under a programmatic EIR assessment.[71]

Finally, under CEQA, even assuming, arguendo, that the Rodeo Propane Recovery project is not an integral part of this proposed Project, the RDEIR still failed to adequately discuss the Rodeo project, and should at a minimum have discussed the need to recover propane or butane from sources facilitated by the rail spur expansion.[72] The company's ownership of the pipeline gives the company proprietary rights and ownership of all shipments. The impacts are cumulatively considerable and should have been assessed in the RDEIR.

(iii) Both the Rail Spur Extension Project and the Propane Recovery Project Lack any Independent Utility.

Under California law, where one part of an arguably larger project serves some "independent utility," the lead agency may focus solely on that smaller part of the project.[73] For the reasons detailed above, however, this Project, the rail spur extension, bears no independent utility. The project is piecemealed and the County should review the overall impacts, especially the cumulative impacts, of the larger project.

III. THE RDEIR'S PREEMPTION ASSERTIONS PRECLUDE A MEANINGFUL ANALYSIS OF PROJECT IMPACTS.

The DEIR erroneously purports that mitigation is preempted by federal law, thereby avoiding critical measures to abate the hazards and impacts of increased crude by rail transport through California Communities.

The RDEIR states that:

> The operation of unit and manifest trains to and from the Rail Spur Project Site would be performed by UPRR, on UPRR property, and on trains operated by UPRR employees. The movement of those trains within San Luis Obispo County to and from the Project Site … may be preempted from local and state environmental regulations by federal law under the Interstate Commerce Commission Termination Act of 1995 … the County as CEQA Lead Agency, and other state and local responsible agencies may be preempted from imposing mitigation measures, conditions or regulations to reduce or mitigate potential impacts of UPRR train movements on the mainline.[74]

Similar statements to this effect are repeated throughout the RDEIR.[75]

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[71] CEQA Guidelines, § 15378, subd. (a) agency must evaluate the environmental impacts of the whole of the action.
[72] *Laurel Heights I*, 47 Cal.3d at 398 (requiring discussion "in at least general terms" of future activity in connection with a project, even if the project is contingent on uncertain occurrences).
[73] Del Mar Terrace Conservancy, Inc. v. City Council of San Diego, 10 Cal. App. 4th 712 (1992).
[74] EIR at ES-22.
[75] *See, e.g.*, RDEIR at ES-6, 1-7, 1-8, 2-2, 4-1. The EIR correctly states that mitigation addressing impacts, including air emissions, within the SMR facility boundaries can be mitigated because Phillips 66 controls and operates the facility property. EIR at ES-9; 4.3-5. *See Town of Milford, MA – Petition for Declaratory Order*, STB F.C.C. No.

With little justification or analysis, the RDEIR concludes on several occasions that the impacts of the proposed project will be "significant and unavoidable" because mitigation required by the County as it applies to the mainline and UPRR locomotives may be preempted and therefore unenforceable. The RDEIR reaches the "significant and unavoidable" conclusion based on preemption for a range of impacts caused by the project. Specifically, the RDEIR states that the following mitigation measures could be preempted by federal law:

- Measures to improve emergency response and oil spill clean-up along the mainline to reduce impacts to adjacent agricultural crops, sensitive biological and cultural resources, and ground and surface water resources.[76]
- Mitigation measures imposed along the mainline tracks addressing emergency responder notification and training.[77]
- Mitigation measures to require the use of Tier 4 locomotives outside the SMR property to address emissions from locomotives, including cancer-causing toxic emissions, which will result in exceedances of air district thresholds along the mainline.[78]
- Mitigation measures that would reduce greenhouse gas emissions associated with locomotives outside the SMR property.[79]
- Mitigation addressing tank car design safety applied to the mainline and UPRR locomotives by the County.[80, 81]

For the following three reasons, the RDEIR's analysis is inadequate and too limited to provide any proper or suitable mitigation.

1. The Interstate Commerce Commission Termination Act Preemption is Not Unlimited.

34444, 2004 WL 1802301, at *2 (S.T.B., Aug. 11, 2004)(when railroads involvement in rail terminal transloading facility owned by a third party is incidental to terminal operations, STB has no authority, [therefore state has full authority over CEQA review of the proposed SMR project]); *High Tech Trans, LLC – Petition for Declaratory Order*, STB F.D. No. 34192, 2003 WL 21952136, at *1 (S.T.B., Aug. 14, 2003)(railroad delivered cars, but transloading facility owned and operated by a non-railroad third party).

[76] EIR at ES-8; ES-10; ES-14; 4.4-47, 48; 4.5-15; 4.7-63; 4.8-26; 4.13-28.

[77] EIR at ES-13; 4.4-47, 48; 4.11-29, 32.

[78] EIR at ES-9; 4.3-5, 48, 50, 56, 63, 67, 68, 75, 76; 5-44, 48.

[79] EIR at ES-9; 4.3-71, 77.

[80] EIR at ES-11; 4.4-47, 48; 4.13-28; 5-48; 51.

[81] The EIR cannot simply rely on the U.S. Department of Transportation's rulemaking to ensure safer tank car designs will serve the project and reduce the hazards of crude by rail transport. That rulemaking proposes several alternatives for new tank car designs, which reduce risks of crude by rail transport to varying degrees, and that rulemaking has not yet been finalized. Therefore, there is significant uncertainty about the degree of safety and risk reduction that will result from the final rule. Moreover, implementation of a final rule, including a phase out of the most dangerous tank cars including DOT111s and unjacketed CPC-1232s, may take as long as six years. As such, the safety benefits of the proposed rule will not materialize until long after the proposed SMR project would begin operation. In the meantime, the U.S. DOT estimates that under the current rail infrastructure network, 15 mainline accidents spilling crude will occur each year and at least one disastrous incident at least as large as Lac Megantic will occur every two years.

Simply concluding that mitigation may be unenforceable and the project's impacts are "significant and unavoidable" because mitigation may be preempted by federal law is a misinterpretation of the intersection between CEQA and ICCTA. As such, failing to require and enforce mitigation is an abdication of the County's responsibilities under CEQA.

The Interstate Commerce Commission Termination Act gives the Surface Transportation Board economic regulatory oversight over the railroad industry, including rates; service; the construction, acquisition and abandonment of rail lines, carrier mergers; and interchange of traffic among carriers.[82] Although the ICCTA provides exclusive authority by the Surface Transportation Board over many aspects of rail transport, the scope of that preemption authority is not limitless.[83] Citing decisions from federal appellate courts, the *Humboldt Baykeeper* court reiterated that ICCTA preemption applies only to state laws "with respect to regulation of rail transportation."[84]

Moreover, state and local entities can implement railroad safety regulations or measures if they are necessary to eliminate an "essentially local safety hazard," and are not incompatible with federal regulations, or unduly burden interstate commerce.[85] Importantly, a state or local requirement must not impact an activity that is integral to railroad operations and must not impose a significant burden on railroad operations.

Courts also have concluded that the ICCTA does not preempt CEQA.[86] Nor does CEQA, which is an informational statute, "unreasonably interfere with interstate commerce."[87] CEQA, which does not regulate rail transportation, is an environmental review law of general application that applies to projects in California that may have a significant effect on the environment. CEQA requires that significant impacts of a project be mitigated if reasonably feasible. A local

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[82] 49 U.S.C. § 10101 *et seq.*

[83] *Humboldt Baykeeper v. Union Pacific RR*, 2010 WL 2179900, *2(N.D. Cal. May 27, 2010).

[84] *Id.* ("ICCTA preemption only displaces "'regulation,' i.e., those state laws that may reasonably be said to have the effect of 'managing]' or 'governing]' rail transportation" and permits "the continued application of laws having a more remote or incidental effect on rail transportation."); s*ee e.g., Fla. E. Coast Ry. Co. v. City of West Palm Beach*, 266 F.3d 1324 (11th Cir. 2001)(application of local zoning and occupational license ordinances against a company leasing property from a railroad does not constitute "regulation of rail transportation" and is not preempted by the ICCTA); *Flynn v. Burlington Northern Santa Fe Corporation*, 98 F. Supp. 2d 1186, 1189-90 (E.D. Wash. 200)(noting that "ancillary railroad operations" such as "truck transfer facilities" are not subject to federal preemption); *Californians for Alternatives to Toxics v. N. Coast R.R. Auth. Et al*, 2012 WL 1610756 (N.D. Cal., May 8, 2012).

[85] 49 U.S.C. 20106(a). *See, e.g., Southern Pacific Transportation Company v. Public Utility Commission of the State of Oregon*, 9 F.3d 807, 812 (9th Cir. 1993); *State of Washington v. Chicago, Milwaukee, St. Paul and Pacific Railroad Company*, 79 Wn.2d 288 (Wash. 1971)(upholding local regulation forbidding the operation of engines without modern spark plug arrestors to prevent fires which are characterized as an essentially local safety hazard). *Flynn v. Burlington N. Santa Fe Corp. (BNSF),* 98 F. Supp. 2d 1186, 1189 (E.D. Wash. 2000) (local authorities can exercise their police powers to protect local community health and safety).

[86] *Humboldt Baykeeper v. Union Pacific RR*, 2010 WL 2179900, *2(N.D. Cal. May 27, 2010); *Town of Atherton v. California High-Speed Rail Auth.,* 228 Cal. App. 4th 314, 330-31, 175 Cal. Rptr. 3d 145, 159-60 (2014) (relying on market participant doctrine); and s*ee generally Ass'n of American Railroads v. South Coast Air Quality Management District*, 622 F.3d 1094, 1097 (9th Cir. 2010). *But see Friends of the Eel River v. N. Coast R.R. Auth.* (Sept. 29, 2014, !st Dist. Ct. App., Case No. A139235), *available at* http://www.courts.ca.gov/opinions/documents/A139222.PDF.

[87] *Id.*

government's environmental and health policy goals to achieve efficient and safe market participation are perfectly acceptable policies through which to enforce mitigation measures that abate the externalities of increased volatile and toxic crude by rail service through communities.[88]

Without analysis, the RDEIR erroneously concludes that mitigation along the mainline is infeasible because it may be preempted. However, a factual assessment of the Project's proposed mitigation, which is absent from the RDEIR, demonstrates that mitigation measures to abate serious local and regional air quality problems and to adequately prepare for local emergency response and spill planning do not "unreasonably interfere with railroad transportation" and therefore are not preempted.[89]

2. CEQA Mitigation is Necessary to Abate Serious Public Health and Safety Impacts Posed by the Project and is not Preempted by the ICCTA.

Proposed mitigation along the mainline directly addresses the local safety and environmental threats posed by the movement of hazardous crude by rail through communities. In particular, the burden of increased air pollution emissions from locomotives and tank cars—including volatile organic compounds and cancer-causing toxic air pollutants—on communities already adversely impacted by poor air quality present a significant local safety concern. Environmental justice communities along the mainline rail route including Richmond, Oakland, and Martinez, and cities throughout California's Central Valley already experience increased adverse health effects from poor local air quality, making mitigation of locomotive air emissions even more critical. Accordingly, the mitigation of air emissions proposed in the RDEIR and other measures not proposed but urgently needed to limit VOC and GHG releases from tank cars must be required and enforced to abate the heightened health and safety risks created by multiple mile-long crude trains traveling through highly impacted communities.[90] Notably, mitigation of tank cars, all of which are owned by Phillips 66,[91] to prevent release of VOCs and greenhouse gases can be implemented even before the cars are handed off to UPRR for operation during transport.

Indeed, requirements of locomotives and tank cars to reduce dangerous air pollution along the mainline do not "deny [the] railroad the ability to conduct some part of its operations", nor does such mitigation interfere with matters "directly regulated" by the Surface Transportation Board, such as "construction, operation, and abandonment of rail lines; railroad mergers, line acquisitions, and other forms of consolidation; and railroad rates and service."[92] Moreover, such mitigation "can be obeyed with reasonable certainty" and avoid "extended or open-ended delays."[93]

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[88] *Town of Atherton v. California High-Speed Rail Auth.,* 228 Cal. App. 4th 314, 330-31, 175 Cal. Rptr. 3d 145, 159-60 (2014).
[89] *Id.* at 164.
[90] EIR at ES-9; 4.3-5, 48, 50, 56, 63, 67, 68, 75, 76; 5-44, 48.
[91] EIR at ES-5.
[92] *Town of Atherton v. California High-Speed Rail Auth.,* 228 Cal. App. 4th 314, 330-31, 175 Cal. Rptr. 3d 145, 159-60 (2014).
[93] *Green Mountain R.R. Corp. v. Vermont* (2nd. Cir. 2005) 404 F.3d 638, 643.

Similarly, mitigation addressing emergency response—including notification and training of first responders and coordinated oil spill clean-up and incident response planning—are critical measures that must be taken to address serious safety risks. These risks include risk of derailments and spills that threaten contamination of entire drinking water sources and destruction of downtown urban areas, as well as agricultural, cultural, and sensitive biological resources.[94] Indeed, the warnings by the National Transportation Safety Board and the record evidence in the U.S. Department of Transportation crude rail safety rulemaking demonstrate that crude by rail transport in DOT111 and unjacketed CPC 1232 tank cars (proposed for use in this project) is high risk. Damages from derailments, resulting in fires, explosions and spills are extremely damaging and costly to clean up. The risks are especially exacerbated for communities along the rail lines that bear the burden of catastrophic damages from accidents. These mitigation measures do not deny UPRR from continuing to provide service, nor do such measures "discriminate" or "unduly burden" rail transport serving the SMR project. Accordingly, these measures must be required and enforced to abate heightened local safety problems.[95, 96]

3. ICCTA Preemption is Improper because it Undermines a Local Government's Ability to Comply with other Federal Statutes.

Further, preemption by the ICCTA is improper because mitigation within the SMR facility and along the mainline is necessary to ensure compliance with other federal statutes such as the Clean Air Act and Clean Water Act.[97] Specifically, air pollution mitigation to reduce toxic cancer-causing emissions must be required to ensure Clean Air Act pollution thresholds are not exceeded.[98] In addition, much of California is nonattainment for state and federal Clean Air Act ozone and PM2.5 standards. The cumulative impacts of locomotives supporting the many crude by rail projects proposed or in operation in the state would significantly interfere with compliance of Clean Air Act ozone and PM2.5 standards as well as meeting Regional Haze requirements.[99] As such, absent mitigation on locomotive emissions, the additional air pollution from trains serving the proposed project would impede compliance with these federal standards.

Further, oil spill response planning, including training and notification, is necessary to fulfill local governmental responsibilities under the Clean Water Act. The federal statute, amended in 1990 by the Oil Pollution Act, includes mandates that preserve the authority of state and local governments to impose additional oil spill prevention and clean-up requirements.[100] Accordingly, mitigation measures that advance the Clean Water Act's mandates of oil spill

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[94] EIR at 4.5-14; 4.7-63; 4.13-28.
[95] *Id.* at 160,162.
[96] The DEIR must not simply rely on California law AB861 for additional forms of emergency response mitigation as that law is under attack by the rail industry and the subject of a legal challenge. Moreover, that law does not address the particular safety needs of individual communities and water sources along the mainline. As such, additional mitigation measures addressing local emergency response and spill prevention must be required.
[97] *Flynn v. Burlington N. Santa Fe Corp. (BNSF),* 98 F. Supp. 2d 1186, 1189 (E.D. Wash. 2000).
[98] EIR at 4.3-50.
[99] *See* http://www.arb.ca.gov/desig/desig.htm. In addition, the California compliance plan for Regional Haze under the Clean Air Act includes phasing in new locomotive engines. *See* Table 1 of: Progress Report at: http://www.arb.ca.gov/planning/reghaze/progress/carhpr2014.pdf.
[100] 33 U.S.C. § 1321(o)(1)-(2).

prevention and effective response are necessary and enforceable in communities directly impacted by crude transport servicing the proposed project.

In sum, while the ICCTA may preempt some state laws and regulations, it is not a blanket preemption that applies to every state law or regulation that touches on railroads in any way. The RDEIR has unlawfully dismissed critical mitigation measures to protect the public health, safety and environment of California communities directly impacted by the proposed project. The RDEIR does not cite any authority that supports the position that CEQA mitigation is preempted by ICCTA. The RDEIR's statements of federal preemption are overly broad and simplistic, and fail to recognize the nuance in preemption questions, especially when state police power to protect the public health and safety are involved. Consequently, the RDEIR's analysis has not satisfied the legal requirements under CEQA for "significant and unavoidable" impacts. These flaws compound the many other inadequacies of the RDEIR's impacts analysis as detailed immediately below.

IV. THE DEIR'S ANALYSIS OF AND MITIGATION FOR THE IMPACTS OF THE PROPOSED PROJECT ARE INADEQUATE.

In order to effectuate the fundamental purpose of CEQA, it is critical that an EIR meaningfully inform the public and its responsible officials of the environmental consequences of their decisions *before* they are made."[101] Only with a genuine, good faith disclosure of a proposed project's components, can a lead Agency analyze the full range of potential impacts of the project, identify, and implement mitigation measures where necessary, prior to project approval.[102]

Nevertheless, because the RDEIR still fails to include integral project components and the SFR's overall switch to tar sands in its analyses, the RDEIR still asks the wrong questions, diminishing or even foreclosing an analysis of the Project's environmental impacts, even those it determines to be significant. In several of those instances, the RDEIR lacks the necessary detail to verify the validity of its analyses. Consequently, the RDEIR fails to include a sufficient analysis of the Project's impacts as required by CEQA.[103] These include significant and unmitigated impacts to: air quality, public and worker health and safety, water quality and supply, agriculture, biological resources and the local community in the Nipomo Mesa area.

A. The DEIR Fails to Adequately Analyze and Mitigate the Project's Air Quality Impacts.

The RDEIR's analysis of the Project's criteria pollutant impacts is riddled with errors.

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[101] *Laurel Heights Improvement Ass'n v. Regents of University of California* (1993) 6 Cal. 4th 1112, 1123; CEQA Guidelines § 15126.2(a) ("[a]n EIR *shall* identify and focus on the significant environmental effects of the proposed project") (emphasis added throughout).

[102] Pub. Res. Code § 21002 (public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects); Guidelines § 15126.4.

[103] *See*, *Laurel Heights Improvement Assn. v. Regents of Univ. of California, supra,* 47 Cal.3d, at 400 (*quoting* Pub. Resources Code § 21002.1(a); and Guidelines 15002(a)). *See also*, *Communities for a Better Environment v. Richmond, supra*, 184 Cal.App.4th, at 89 (an "EIR must include forseeable change in crude processed as part of environmental and impacts analysis.").

We highlight several: first, the EIR relies on an inadequate study area and therefore underestimates the Project's potential to result in a substantial increase in criteria pollutant emissions. Second, the RDEIR's analysis is predicated on a vague, faulty and illegal baseline. Third, the RDEIR's analysis ignores any increase in toxic or hazardous air pollutants from the increased refining of tar sands. Fourth, the RDEIR does not analyze all of the project's components. Fifth, the Project's climate change implications are completely underestimated. Sixth, the RDEIR's analysis relies on an illegal use of Emission Reduction Credits. Finally, the EIR fails to properly address emissions from construction activities. The end result is that the Project will result in significant air quality impacts that the EIR fails to identify or mitigate.

(i) The DEIR Incorporates an Inadequate Study Area.

The study area of an EIR must include "the area which will be affected by a proposed project."[104] There is no predefined geographic limit to where impacts can occur, and it is well established that "the area that will be affected by a proposed project may be greater than the area encompassed by the project itself."[105] This broad understanding of the geographic scope of an EIR's analysis is essential, and "the purpose of CEQA would be undermined if the appropriate governmental agencies went forward without an awareness of the effects a project will have on areas outside of the boundaries of the project area."[106]

The RDEIR still substantially underestimates the Project's increase in greenhouse gas ("GHG") and criteria air pollutant emissions because it relies on an artificially and unnecessarily constrained study area. The DEIR's air impact analysis is unnecessarily limited to the immediate vicinity of the Rail Spur.[107] Our prior comments[108] made this same observation. The RDEIR attempts to ameliorate the deficiency by employing significance criteria from the SLOCAPCD CEQA Air Quality Handbook.[109] The Handbook, however, emphasizes the necessity for a "complete and accurate project description," and full disclosure of potential air pollutants and toxic air contaminants."[110] The RDEIR cannot use the Handbook as any measuring stick until it adequately discloses the full scope and impacts of this Project.

Furthermore, as noted throughout this comment, the air quality impacts of the Project will regularly extend far beyond the county line. By artificially limiting the geographic scope of the analysis to air pollutants emitted within the boundaries of San Luis Obispo County, the RDEIR substantially underestimates the significant air quality impacts of refining tar sands at the SFR. The RDEIR should be revised to evaluate these Project emissions that occur in and outside of the County, and to discuss mitigation for those emissions.

(ii) The DEIR Uses an Inappropriate Baseline Environmental Setting, Rendering its Air Quality Analysis Unreliable.

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[104] *See* Cal. Pub. Res. Code § 21060.5 (defining "environment" as "the physical conditions that exist within the area which will be affected by a proposed project").
[105] *Save the Plastic Bag Coalition v. City of Manhattan Beach* (2011) 52 Cal.4th 155, 173.
[106] Muzzy Ranch Co. v. Solano Cnty. Airport Land Use Com. (2007) 41 Cal. 4th 372, 387.
[107] RDEIR at 4-2.
[108] *See* Attachment C.
[109] RDEIR at 4.3-33.
[110] *See* SLOCAPCD CEQA Air Quality Handbook at 1-3.

The RDEIR's baseline is vague. It is not clear what baseline the RDEIR uses, but to any degree, relies on permitted levels. This reliance on permit limitations instead of actual emissions to establish baseline air quality is a clear violation of CEQA. This precise discrepancy was at issue in *Communities for a Better Environment v. South Coast Air Quality Management District*, where the Supreme Court rejected the Air District's argument that permit levels should be used to establish the baseline.[111] The Air District argued that for a project employing existing equipment, the baseline should be the maximum permitted operating capacity of the equipment, even if the equipment is operating below those levels when the Notice of Preparation is issued.[112] The Supreme Court rejected the District's illegal permit based approach, and clarified the need for the proper assessment of baseline for review under CEQA.[113] The County should similarly reject the RDEIR's use of a vague and illegal baseline that also employs measurements from another piece of the same larger project, further corroborating that this Project is piecemealed.

(iii) The DEIR Fails to Identify or Mitigate Additional Impacts of Emissions Resulting from the Project's Change in Crude Slate.

The RDEIR fails to analyze the increase in Toxic Air Contaminants ("TACs") and Hazardous Air Pollutants ("HAPs") from refining tar sands. As mentioned throughout this comment, the expert reports, and the comments and expert reports to the DEIR, tar sands crudes are distinct from even the heaviest of crudes processed in the past at the SMR, for two principal reasons: (1) the unique chemical composition of the bitumen itself; and (2) the presence of large quantities of volatile diluent containing high levels of VOCs, TACs and HAPs. When released, these air pollutants cause significant public health and air quality impacts that are inadequately addressed in the RDEIR.[114]

TAC and HAP emissions in "DilBit"

Tar sands crudes alone are comprised of higher molecular weight chemicals than the current slate processed at the SMR, including large amounts of benzene, toluene, ethyl-benzene, xylenes,[115] and other heavy metals such as lead. These chemicals are found in both state and federal toxic emissions inventories, and are, therefore, of particular concern to both federal and state regulatory agencies.[116] As stated in CBE's Comments to the DEIR, the U.S. Geological Survey reports that "natural bitumen," the source of all Canadian tar sands-derived oils, contains 102 times more copper, 21 times more vanadium, 11 times more sulfur, six times more nitrogen, 11 times more nickel, and 5 times more lead than conventional heavy crude oil.[117]

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[111] *Communities for a Better Env't v. S. Coast Air Quality Management District* (*CBE v. SCAQMD*) (2010) 48 Cal. 4th 310.
[112] *CBE v. SCAQMD*, 48 Cal. 4th at 320.
[113] *Id.*
[114] To the extent the RDEIR fails to cure errors regarding the Project's public health impacts, raised by CBE in its comment to the DEIR, the same comments are hereby incorporated by reference.
[115] Together referred to as "BTEX" compounds.
[116] *See, e.g.*, United States EPA, Clean Air Act 1990 List of Hazardous Air Pollutants, available at: http://www.epa.gov/ttn/atw/orig189.html, last accessed on Jan 26, 2014; *see also*, California Air Resources Board Toxic air Contaminant Identification List, available at: http://www.arb.ca.gov/toxics/cattable.htm#Note 1, last accessed on Jan 26, 2014.
[117] *See*, Fox Report to DEIR.

When blended with the diluents, tar sands "dilbit" crudes contain even higher concentrations of BTEX compounds, which have a significantly high potential to be released by way of transport and process related emissions that also remain underestimated in the RDEIR. These contaminants can cause severe impacts on the environment, and can lead to grave human health problems. Moreover, because diluents also have a notably low molecular weight, and a high vapor pressure, they are highly prone to cause fugitive, gaseous releases by increasing vapor pressure in various refinery operation components throughout the SFR, including rail cars and pipelines used for transport to and between the Santa Maria and Rodeo facilities.[118]

Potential and Known Public Health Impacts

Despite the known severe health effects of the HAPs including BTEX compounds present in "DilBit" crudes, the RDEIR incorporates a number of assumptions and flawed emissions estimates that lead to a faulty analysis of the range of significant impacts from their release into the environment, and as a result the RDEIR fails to state adequate mitigation.[119] While the RDEIR now acknowledges the shift in the overall crude slate that will be enabled by the Project, and discloses the fact that Phillips 66 currently processes only a small portion of Canadian tar sands crudes,[120] the document still fails to address potentially severe impacts from Project emissions including the range of potential health impacts from known carcinogens and other harmful pollutants; acid rain; bioaccumulation of the toxic contaminants contained in the Project's potential emissions; the formation of ground-level ozone and smog; visibility impairments; odor impacts affecting residents near the Refinery; accidental releases due to corrosion of refinery equipment; and depletion of soil nutrients.[121]

As discussed in CBE's comments on the DEIR, benzene alone has notably high cancer potency, and is known to cause severe reproductive, developmental and immune systems impacts at even low exposure levels.[122] Systemic benzene poisoning, a long term exposure risk, includes the potential for severe hemorrhages, and may at times result in fatality.[123] Concentrated, acute exposure levels have also been known to cause headaches, and nausea.[124] While less information is available relating to longer term systemic and acute exposure levels to ethylbenzene, toluene and xylene, in California, the toxicity and risk levels of the three are currently under CARB scientific review.[125]

Flaws in the RDEIR's Analysis of Impacts to Public Health

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[118] *See* Fox Report to DEIR, at 22 (explaining that these contaminants are present in highly dangerous concentrations in "DilBits" as a result of their composition of both undiluted tar sands bitumen crudes and diluent mixtures.).
[119] RDEIR 4.3-59.
[120] RDEIR 2-33.
[121] *Id*.
[122] Determination of Acute Reference Exposure Levels for Airborne Toxicants, March 1999, Acute Toxic Summary, BENZENE, available at: http://www.oehha.ca.gov/air/acute_rels/pdf/71432A.pdf, last accessed, November 24, 2014.
[123] *Id*.
[124] *Id*.
[125] California Air Resources Board, Toxic Air Contaminant Identification List, available at: http://www.arb.ca.gov/toxics/cattable.htm#Note 1, last accessed, November 24, 2014.

While the RDEIR incorporates the Health Risk Assessment (HRA) conducted in the Environmental Review process and its relative cancer risk assessments, it fails to identify, analyze or mitigate, the associated, **non**-cancer causing, potentially severe public health risks resulting from both construction and operation of the project, and from both the transport and refining activities enabled Project operations.

The RDEIR assumes an increase of BTEX compound emissions at the SMR from 0.81 to 1.25%, and it defines and analyzes the scope as well as the relative significance of this increase in terms of "the probability of developing cancer" as a result of "exposure to a given chemical, at a given concentration." [126] By referring exclusively to the HRA to analyze the Project's impacts resulting from increased BTEX emissions,[127] the RDEIR concludes that the increase in BTEX levels at the facility affect both acute and chronic cancer risk levels only *minimally*, with a 0.03 and 0.002 increase in each, respectively, with the highest risk occurring at the SMR parcel boundary immediately south and west of the rail spur location due to diesel emissions from the rail spur operations, which the RDEIR further concludes is "not a significant impact because no residential receptors are located there."[128] Indeed, the highest cancer risk reported in the RDEIR, and the in the HRA occurs north of the facility primarily due to the current trucking diesel emissions at residential receptors.[129]

The RDEIR cannot solely rely on the HRA's assessment of relative cancer risk to determine the level of significance of potential TAC and HAP emissions, and provide adequate mitigation and the fact that is does so, violates CEQA's requirement to include a sufficient analysis of local, direct, indirect and cumulative impacts.[130]

As explained above, BTEX compounds known to be present in high concentrations in "DilBit" both in combination and each separately, present serious, non-cancer risks that must be independently analyzed. Moreover the RDEIR's analysis is focused on the areas directly adjacent to the Project area, precluding the document's analysis of increased public health risks caused by transport along the rail lines, and by refining at the Rodeo facility. The RDEIR must analyze and mitigate these impacts, as they are not otherwise analyzed for the purpose of meeting CEQA's requirements in the HRA.

The RDEIR further fails to state other, specific information necessary to assess the potential human health impacts from the Project, such as information regarding the concentration of diluents that will be present in those crudes, resulting in the public's need to guess, based on outside information, what an approximate mix of diluents to tar-sands bitumen might be. Readers of an EIR should not be forced to rely on outside research and resources to find important components of a thorough environmental analysis.[131] Information regarding the

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[126] RDEIR 4.3-60.
[127] *Id*.
[128] RDEIR 4.3-61 (emphasis added).
[129] *Id*.
[130] *See*, *Laurel Heights Improvement Assn. v. Regents of Univ. of California, supra,* 47 Cal.3d, at 400 (*quoting* Pub. Resources Code § 21002.1(a); and Guidelines 15002(a)).
[131] *San Joaquin Raptor Rescue Ctr. v. County of Merced* (2007) 149 Cal.App.4th 645, 649; *see also*, *California Oak Found. v. City of Santa Clarita* (2005) 133 Cal.App.4th 1219, 1239.

concentration of heavy metals, chemicals and organic compounds contained in the crude is critical to assessing the scope and extent of impacts from potential emissions caused by these crudes, and impacting public health in the areas surrounding the San Francisco Refinery facilities. While we may conjure the amount of diluents and tar sands blend used at the Refinery, through piecing together other data, it is a grave problem that the precise amount of diluents used to transport, store or otherwise process tar sands crudes arriving at the Santa Maria facility by rail is entirely omitted from the RDEIR analysis.

Moreover, the RDEIR fully omits any impact analysis for other harmful, air pollutants such as lead, which the California Air Resources Board (CARB) and the Center For Disease Control have identified as a pollutant for which there is no safe level of exposure.[132] Indeed, the RDEIR fails to even state a baseline level for the current level of lead emissions, upon which any additional increase must be measured. In comments to the DEIR, CBE pointed out that based on CARB's findings the increase in lead from switching even a minimal percentage of the Refinery's current crude slate to tar sands alone is a significant impact.[133] Yet the RDEIR continues to omit any mention of the Project's potential to drastically increase lead emissions, by shifting the Refinery's overall crude slate. The potential health impacts from led are, moreover, deeply concerning, as they can include serious, permanent neurological damage, particularly in children. The RDEIR's failure to identify, much less analyze or mitigate this category of known potential impacts stemming from the change in crude slate enabled by the project, therefore, highlights one, crucial example of the failings of the RDEIR, which must be corrected, in a revised, and re-circulated document.[134]

The RDEIR Fails to Identify, Analyze and Mitigate the Cumulative Impacts Caused by TAC and HAP Emissions at the Rodeo Refinery

Finally, because the Project's crude slate change will increase TAC and HAP emissions from **all** fugitive components in the Refinery, including both the Santa Maria and Rodeo facilities; through compressors, pumps, valves, fittings, and tanks, in far greater amounts than from the current baseline feedstock,[135] the RDEIR must analyze the range of potential impacts from this shift, in relation to both the Santa Maria and Rodeo facilities, as they together comprise the San Francisco Refinery. This failure to adequately analyze increased TAC and HAP emissions that stem from the physical and chemical composition of the crude imported to the SMR by way of the Project, and processed at the SFR, results in a critical omission of significant, public health impacts, and violates CEQA.[136]

(iv) The DEIR Does Not Analyze Emissions from All of the Project's Components.

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[132] *Id*.
[133] *See* CBE Comment to DEIR.
[134] *See*, *Laurel Heights Improvement Assn. v. Regents of Univ. of California, supra,* 47 Cal.3d, at 400 (*quoting* Pub. Resources Code § 21002.1(a); and Guidelines 15002(a)).
[135] *See* Fox Comments.
[136] *See*, *County of Inyo v. City of Los Angeles*, (1977) 71 Cal. App. 3d 185.

The RDEIR fails to analyze all of the Project's components in two respects. First, the RDEIR shirks the lead agency's responsibility to mitigate emissions due to unpersuasive assertions of federal preemption of regulating locomotives. Second, the RDEIR's analysis is limited to those locomotives.

First, the RDEIR improperly dismisses mitigation measures on account of unpersuasive assertions of federal preemption. Specifically, a lead agency should not shirk responsibility to identify adequate mitigation measures on the sole basis of such an assertion. Rather, lead agencies must identify suitable mitigation measures, and not end an analysis because of a legal roadblock to but one of a menu of options for mitigation.

Second, the RDEIR still fails to assess emissions from all integral components of the Project. The RDEIR identifies operational emissions from "the operation of locomotives (both onsite and offsite), fugitive emissions from components and from the vapor recovery carbon canisters, and from vehicles associated with employees and the transportation of materials."[137] Most blatantly, this fails to assess the air quality impacts of the SFR as a whole, and includes neither an analysis of the emissions that will be caused at the Rodeo component as a result of the rail spur extension, nor the increased emissions of refining increased quantities of tar sands at the Santa Maria component.

CEQA requires that an EIR consider the impacts of a whole project, not simply its constituent parts, when discussing the environmental effects of the project.[138] As discussed *supra* in Part II, an essential element of this Project is a shift to a different-quality crude slate, and the Santa Maria Throughput Expansion, Rodeo Propane Recovery Project and this Project are at least three integral components of this piecemealed project. Consequently, this DEIR should include an analysis of the full scope of air quality impacts resulting from this larger piecemealed project, not just the impacts from the Rail Spur Extension Project.

In addition, because the DEIR does not disclose the scope of tar sands that will be brought to the SFR as a result of the rail spur expansion, the RDEIR cannot analyze the severe air quality impacts that will result from processing those increased quantities first at the Santa Maria facility, and subsequently the Rodeo facility. The refining of this different quality crude slate can be reasonably expected to require an increase in frequency and magnitude of flaring at Santa Maria, since dirtier crude processing would likely increase "malfunction" and "emergency" flaring.[139] Moreover, a malfunction or emergency upset causes the whole contents of one or more major process vessels to depressurize suddenly, and each flaring event can cause acute exposures to emitted pollutants.[140] Each of these flaring episodes comes with associated and extremely high levels of additional pollution that the RDEIR's analysis ignores.

In addition, the daily operation and refining of a different quality crude slate will result in increased daily emissions of pollutants, including many toxic/PM precursor/smog-forming air

[137] RDEIR at 4.3-32.
[138] *See* CEQA Guidelines, 14 Cal. Code Reg. § 15003(h); *Citizens Assoc. for Sensible Degvelopment of Bishop Area v. County of Inyo* (1985) 172 Cal.App.3d 151.
[139] *See* Karras Rodeo Report.
[140] *Id.*

pollutants from burning more fuel per barrel to process the likely denser/dirtier crude feeds.[141] An increase in fugitive emissions and heightened concentrations of toxic VOCs can also be anticipated as a result of the higher pressure processing of denser crudes.[142] The RDEIR does not analyze these effects, either at the Santa Maria or Rodeo ends of the SFR, and consequently, also fails to discuss mitigation measures for these impacts.

The environmental review of this Project presents a critical opportunity to engage in a genuine and thorough review of the full environmental impacts of this Project. By failing to analyze the emissions from all components of the larger project, the DEIR obfuscates the full extent of air quality impacts, and renders informed decision-making on this Project impossible.

(v) The RDEIR Fails to Adequately Analyze the Significant Climate Change Implications of this Project.

The RDEIR wholly underestimates the significant, and irreversible, effect that the project presents to climate change. Although the RDEIR makes references to the Intergovernmental Panel on Climate Change, it's references are outdated, and in fact contradicted by more updated reports. Specifically, the RDEIR fails to acknowledge the Intergovernmental Panel on Climate Change's recently voiced and serious concerns regarding the "irreversible" effects of climate change.[143] The report concluded that "continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts," calling for the need for dramatic cuts in pollution.[144]

In the face of that warning, the Project admits a climate change impact that is significant and unavoidable.[145] However, no intelligent weighing of whether to live with that impact is possible without first establishing the degree of that significant impact. The RDEIR underestimates even this significant impact. Not only does its analysis restrict the scope of impacts to generally locomotive and ancillary emissions, ignoring the climate change impacts of this larger tar sands project, but even that analysis is plagued with ambiguity and a failure to analyze alternative mitigation measures.

(a) The RDEIR Fails to Analyze All GHG Emissions from All Components of the Project.

As noted throughout this comment, the Project is piecemealed. In regards to climate change impacts, the RDEIR must disclose all of the SFR's GHG emissions that the Project will enable not only at the Santa Maria facility, but also at the Rodeo end of the facility. Moreover, as acknowledged by the RDEIR, the climate change impacts of refining are correlated to the

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[141] *Id.*
[142] *Id*.
[143] *See eg.* "Effects of Climate Change "Irreversible"' available at http://www.washingtonpost.com/national/health-science/effects-of-climate-change-irreversible-un-panel-warns-in-report/2014/11/01/2d49aeec-6142-11e4-8b9e-2ccdac31a031_story.html?hpid=z1
[144] Report attached as Attachment D.
[145] RDEIR at 4.3-71.

quality of the feedstock refined.[146] Refining tar sands at the SFR, compared to refining the more traditional blend, creates far greater GHG emissions and therefore climate change implications. Until the RDEIR corrects its Project Description regarding the degree of shift to refining tar sands at the SFR, its analysis cannot provide any adequate analysis of the Project's, already determined as significant, impacts to climate change.

In addition, CEQA requires an EIR to consider both direct and indirect impacts of a proposed project.[147] Indirect impacts are those that are "caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable."[148] The scale of the Project's activities is large enough that off-site emissions could reasonably be affected. Moreover, the indirect nature of these wholly foreseeable off-site emissions cannot be ignored as "it is inaccurate and misleading to divide the project's air emissions analysis into on-site and secondary emissions for purposes of invoking the presumption the project will have no significant impact."[149] Thus, the RDEIR requires a sufficient analysis and discussion of these sources. For example, in *North Coast Alliance*, the lead agency's analysis of the identification of indirect sources of GHG emissions from electrical demand was found sufficient given that the agency conducted a thorough analysis of the project's demand on a utility's electricity generation and whether it would increase production at any fossil-fuel power plants.[150]

Similarly here, an inextricable link exists between the Santa Maria and Rodeo ends of the SFR. Just as it was foreseeable in *North Coast Alliance* that utility demand would be met, it is just as foreseeable, if not a certainty, that the Rodeo facility will exactly meet the demand of the Santa Maria facility's export by the pipeline, owned by Phillips 66, that connects the two facilities. The RDEIR fails to acknowledge the full scope of GHG emissions from the Project. By limiting the study of GHG emissions to largely locomotive and associated operations alone, but one component of the overall Project, the RDEIR omits entirely a significant portion of the emissions that will result from the Project, and thus vastly underestimates the Project's significant air quality impacts.

Emissions from the Rodeo facility include increased GHG emissions resulting from the processing of tar sands, as well as the off-site emissions from the propane and butane produced via the Propane Recovery Project and the off-site emissions associated with natural gas demand activities. The RDEIR must, at the least, identify these foreseeable activities and then adequately analyze and estimate how much the Project is likely to increase emissions from all of these sources, regardless of their location. At a minimum, the RDEIR must address these emissions as reasonably foreseeable cumulative impacts, as more fully addressed below.

(b) The RDEIR's Proposed Mitigation of Project GHG Emissions is Inadequate.

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[146] RDEIR at 4.3-70.
[147] CEQA Guidelines, 14 Cal. Code Reg. § 15358(a).
[148] CEQA Guidelines, 14 Cal. Code Reg. § 15358(a)(2).
[149] Kings County Farm Bureau v. City of Hanford (1990) 221 Cal. App. 3d 692, 717.
[150] North Coast Alliance v. Marin Mun. Water Dist. Bd. of Directors, 216 Cal.App.4th 614, 652 ("Based on this evidence, the EIR concluded the Project's energy demand would not result in an indirect increase in pollutant emissions.").

The RDEIR's proposal to mitigate all of the Project's increased GHG emissions is too vague, speculative, and a potentially illegal use of Emission Reduction Credits ("ERC's"). This is how the RDEIR proposes to mitigate the Project's potentially massive increase in GHG emissions:

> Mitigation Measure AQ-6: Prior to issuance of the Notice to Proceed, the Applicant shall provide GHG emission reduction credits for all of the project GHG emissions for the life of the project. Coordination with the San Luis Obispo Planning and Building Department should begin at least six (6) months prior to issuance of operational permits for the Project to allow time for refining calculations and for the San Luis Obispo Planning and Building to review and approve the emission reduction credits.

An ERC is a credit granted to a facility that voluntarily reduces emission beyond a certain required level of control; it then provides the authority to emit the regulated pollutant in an amount equal to that original reduction. One principle issue with ERCs is that these emission reductions may have been realized elsewhere from the project location. There may be no real emission reduction in the actual project area. Therefore, the cumulative impact of any emissions increases, addressed by such credit related mitigation measures, remains and goes wholly unanalyzed, along with the emission of any associated, and potentially also separately significant co-pollutants. This oversight of impacts to the most vulnerable sections of our population pervades the RDEIR. In addition, the RDEIR's proposed use of these ERCs is wholly vague. Its analysis hopes to avoid the use of additional ERC's to mitigate GHG emissions from locomotive operations, yet is unable to come to a conclusion of whether and how much would be necessary in order to do so.

In addition, the RDEIR lacks any attempt to quantify the amount of GHG reductions that could be achieved by ERCs. Is it as simple as a 1:1 ratio/offset? The SLOCAPCD recommends using the CAlEEMod for mobile sources and a partial characterizariton of area source impacts. In cerain cases, it will also suggest alternative methods.[151] What method applies in this case? Regardless, the RDEIR must provide sufficient detail for the decision making body to at least determine whether an exclusively ERC method of mitigation is even feasible.

Also, as more fully detailed below, in 2007, Phillips 66 entered into a settlement agreement with the Attorney General to resolve a conflict over the GHG emissions that would result from a proposed Clean Fuels Expansion Project at the Rodeo Refinery. In this Agreement, Phillips 66 agreed that the ERCs issued by SLOCAPCD for the shutdown of one of its sources cannot be sold or transferred, and could only be used for modifications or expansions at the Santa Maria Refinery.[152] If those ERCs are used at the Santa Maria Refinery, Phillips 66 committed to "offset all GHG emissions that result from the use of the ERCs,"[153] either by GHG reductions at other Phillips 66 refineries or by permanently retiring AB 32 GHG credits. The additional requirements that the use of the ERCs—namely, complete offsetting of GHG emissions resulting from the use of the ERCs—are highly relevant to the air quality analysis in

[151] SLOCAPCD CEQA Handbook, 2012, at 3-14.
[152] Attachment F, Amendment to Settlement Agreement Between ConocoPhillips Company and the Attorney General of California, May 25, 2010..
[153] Attachment F, para. 4.

this RDEIR, and the analysis is incomplete and potentially misleading without including any discussion of this Settlement Agreement. The RDEIR must be revised to provide some adequate quantification of the feasibility of the use of ERCs to mitigate the GHG impacts of this Project. Otherwise, certification of this document would create additional administrative confusion and burden. Although the Attorney General has the authority to enforce those provisions at a later date, the RDEIR must disclose that and at least analyze a scenario of non-compliance, which it fails to do.

Furthermore, the RDEIR's focus and dependence on an overbroad and vague use of ERCs seems wholly misplaced when compared to the GHG mitigation measures proposed by the SLOCAPCD. Certainly, the RDEIR avails itself to the jurisdiction and certain thresholds estabilished by the SLOCAPCD. Despite that, however, the RDEIR chooses to ignore the SLOCAPCD's recommendations on GHG mitigation measures, instead opting for a more unstable option of pursuing ERCs. The SLOCAPCD recommendations include mitigation measures targeting energy efficiency.[154] In particular, the SLOCAPCD recommends onsite renewable energy systems and other community based, more local, solutions.[155] These mitigation measures are not only recommended, but feasible, will create more jobs, and are not plagued by the same environmental justice concerns as the mitigation proposed by the RDEIR. Any environmental review of this proposed Project must address these alternative forms of mitigation that prove more beneficial to the communities immediately and disproportionately already affected by the SFR.

(vi) The DEIR Inappropriately Relies on Emission Reduction Credits to Mitigate the Project's Significant Air Quality Impacts.

The Proposed Project will result in significant increases in emissions of criteria air pollutants (CAPs). The RDEIR proposes to mitigate these impacts by securing ERCs to offset any emissions over the applicable significance thresholds, in order to ensure that emissions "do not exceed the Air District thresholds for the life of the project."[156] The RDEIR proposes to acquire ERCs for ROG + NOx and DPM, both within San Luis Obispo County and outside of the county along the UPR mainline.[157] The RDEIR also intends to reduce toxic emissions below applicable threshold via ERCs.[158] Finally, the RDEIR proposes to mitigate GHG emissions below SLOCAPCD thresholds with GHG ERCs. Mitigation Measure AQ-6 provides that "the Applicant shall provide GHG emission reduction credits for *all* of the project GHG emissions for the life of the project."[159]

(a) The RDEIR Provides Insufficient Information On Its ERC Mitigation Measure.

[154] SLOCAPCD CEQA Handbook, 2012, at 3-17 to 3-20, Table 3-5.
[155] *Id.*
[156] RDEIR at 4.3-53.
[157] RDEIR at 4.3-47 (Mitigation Measure AQ-2a), -53 (Mitigation Measure AQ-3).
[158] RDEIR at 4.3-63 (Mitigation Measure AQ-4), -67 (Mitigation Measure AQ-5).
[159] RDEIR at 4.3-71 (emphasis added).

For ROG + NOx, DPM, and GHGs, the RDEIR's mitigation measures provide that Phillips 66 will be required to secure or provide emissions reduction credits sufficient to bring the Project's emissions below the applicable significant thresholds. However, this is all of the information that the RDEIR provides about the ERCs. The RDEIR does not provide any further information about what ERCs the facility already possess, the quantity of ERCs that may be required, or where ERCs might be acquired from.

The RDEIR does not provide any further information about the quantity of ERCs that might be required to fully mitigate each pollutant, the quantity of ERCs that Phillips 66 already has in the SLOCAPCD bank, or whether Phillips 66 would have to purchase banked ERCs from another certificate holder. The RDEIR does not discuss the offset ratio, in order to determine the number ERCs that would be required to offset each ton of CAP emissions. The RDEIR does not identify the specific ERCs that it plans to use, which makes it impossible to determine whether the ERCs have limitations on use.

Importantly, the RDEIR does not make any mention of the existing settlement agreement between Phillips 66 and the California Attorney General that limits the Refinery's use of ERCs. In 2007, Phillips 66 (then ConocoPhillips) entered into a settlement agreement with the Attorney General to resolve a conflict over the GHG emissions that would result from a proposed Clean Fuels Expansion Project at the Rodeo Refinery. In this Agreement, Phillips 66 committed to permanently surrender the operating permit for the calcining plant at the Santa Maria Refinery, in order to reduce Phillips 66's GHG emissions in California.[160] In a 2010 Amendment to the Agreement, Phillips 66 agreed that the ERCs issued by SLOCAPCD for the shutdown of the calclining plant (ERC Certificate No. 1318-Z1) cannot be sold or transferred, and could only be used for modifications or expansions at the Santa Maria Refinery.[161] If those ERCs are used at the Santa Maria Refinery, Phillips 66 committed to "offset all GHG emissions that result from the use of the ERCs,"[162] either by GHG reductions at other Phillips 66 refineries or by permanently retiring AB 32 GHG credits. Phillips 66 is also required by the terms of the Settlement Agreement to notify the Attorney General "when it submits an application for a project at the Santa Maria Refinery that *may* use all or a portion of the ERCs."[163] The RDEIR does not specify whether these credits will be used in this Project, nor does it specify whether the Attorney General has been notified of the potential use of these credits. The additional requirements that the use of the ERCs on Certificate No. 1318-A1 would trigger—namely, complete offsetting of GHG emissions resulting from the use of the ERCs—are highly relevant to the air quality analysis in this RDEIR, and the analysis is incomplete and potentially misleading without including any discussion of this Settlement Agreement.

Furthermore, the RDEIR makes no commitment to or mention of the permanent retirement of ERCs, and instead proposes to "acquire" or "provide" offsets. Without a commitment to the permanent retirement of ERCs, the mitigation achieved by ERCs would be illusory. The Refinery could simply hold on to the ERCs, and later sell or transfer them, thus allowing emissions levels to increase above this Project's baseline. Phillips 66 must commit to

[160] Attachment F, Exhibit A, para. 1.a.
[161] Attachment F.
[162] *Id.* at para. 4.
[163] *Id.* at para. 7 (emphasis added).

permanently retiring any ERCs that it uses for mitigation in order to ensure that actual, on-the-ground emissions are reduced.

(b) Using Credits to Mitigate CAP Emissions Would In Fact Increase Emissions in San Luis Obispo County and Along the UPR Main Line.

ERC retirement fails to actually mitigate emissions. ERCs represent emission reductions that were made in the past. Thus, the retirement of an ERC today has no impact on actual emissions today. Instead, the retirement of an ERC represents the prevention of a future emissions increase, and a region-wide, "on paper" decrease in allowable emissions levels.

However, CEQA is not concerned with impacts "on paper," but instead with actual, on-the-ground impacts on human health and environmental quality.[164] While ERC retirement may reduce future allowable levels of pollution, thus complying in theory with CEQA's mandate that emissions be reduced below applicable significance thresholds, employing ERC retirement as mitigation for this Proposed Project will result in an increase in emissions in San Luis Obispo County and along the UPR main line above existing levels. This measure would not mitigate the Proposed Project's impacts, but would instead permit the impacts to occur unmitigated. The City should not approve a mitigation measure that would increase CAP, TAC/HAP, and GHG emissions above current levels, and should instead rely on mitigation measures that would result in actual emissions reductions in San Luis Obispo County and along the rail tracks leading to the Refinery.

B. The RDEIR Fails to Adequately Disclose, Analyze, and Mitigate Project-Related Hazards and Public Safety Risks.

An EIR must provide sufficient information to evaluate all potentially significant impacts of a project, including public safety risks due to accidents, and it must state sufficient information to determine "how adverse [an] adverse impact will be."[165] This information is critical to the public and agency decision makers as they evaluate the extent and severity of the Project's impacts, specifically as they relate public safety.

The RDEIR fails to meet this CEQA requirement in three respects: (1) while it mentions an overall change in crude slate as part of the Project, it fails to adequately analyze the implications of that shift as it concerns a realistic and genuine assessment of resultant safety impacts, including those that may stem from routine transport and handling, train car derailments and other accidents, and refining; (2) it applies flawed, underestimated assumptions regarding the increased risks of crude oil spills and resulting impacts, caused by the Project; and (3) it illegally defers mitigation by relying on safety precautions and anticipated plans that will not be implemented within a reasonable time.

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[164] *See, e.g.*, CEQA Guidelines § 15358(b) (limiting CEQA analysis to impacts "related to a *physical* change") (emphasis added); CEQA Guidelines § 15002(g) (defining "significant effect on the environment as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project"); CEQA Guidelines § 15126.4(a) (identifying mitigation measures as those which could minimize significant effects on the environment).

[165] *Santiago County Water District v. County of Orange* (1981) 118 Cal. App. 818, 831.

(i) The RDEIR Does Not Adequately Consider the Specific Impacts of Transporting Tar Sands Crude by Rail.

Numerous accidents including fires, explosions, and spills have resulted from a rapid increase in crude transport across North America. Such incidents have been caused by accidents such as derailments, as well as non-accident releases from leaking valves or vents.[166]

The RDEIR acknowledges that the main hazards associated with the Project include potential fires and explosions that could occur as result of a spill or accident at the SMR, or along the UPRR mainline tracks.[167]

The RDEIR further acknowledges that the Project is one that will necessarily increase the transport and processing of distinctly dense and toxic diluted bitumen-based Canadian crude blends, which are disclosed in the document as "Access Western" and "Peace River Heavy" blends.[168] These crudes and the diluents with which they must be blended to enable their transport and processing pose particularly serious environmental and public health threats when accidentally released into the environment.[169]

In response to the spike in train car derailments and other accidents causing crude spills, the U.S. EPA recently noted that spills of diluted bitumen require different response action and equipment than conventional oil spills.[170] Indeed, three years after a major spill of DilBit into the Kalamazoo River in Michigan, heavy oil remains at the bottom of the river. Resource intensive cleanup is required to remedy the damage caused by the Kalamazoo oil spill, amounting to $1 billion in costs to public funds.[171]

Tar sands bitumen crudes and diluted blends not only pose unique problems regarding cleanup in the event of spills and other accidents, but they also pose serious concerns regarding equipment safety. Government agencies including the Federal Railroad Administration have expressed concern about an increasing number of severe corrosion incidents found in rail tank cars and service equipment.[172] Incidents of derailments and explosions of hazardous materials along California rail routes specifically have also been known to cause extensive environmental

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[166] Mike Soraghan, *Crude Mishaps on Trains Spike As Rail Carries More Oil*, E&E (July 17, 2013), *available at* http://www.eenews.net/stories/1059984505

[167] RDEIR at ES-11; 4.7-42.

[168] RDEIR at 2-33.

[169] Mike Soraghan, *Crude Mishaps on Trains Spike As Rail Carries More Oil*, E&E (July 17, 2013), *available at* http://www.eenews.net/stories/1059984505

[170] EPA, *Comment Letter to US Department of State Regarding the Supplemental Draft Environmental Impact Statement from TransCanada's Proposed Keystone XL project* (2013), *available at* http://www.epa.gov/Compliance/nepa/keystone-xl-project-epa-comment-letter-20130056.pdf.

[171] EPA, *Comment Letter to US Department of State Regarding the Supplemental Draft Environmental Impact Statement from TransCanada's Proposed Keystone XL project* (2013), *available at* http://www.epa.gov/Compliance/nepa/keystone-xl-project-epa-comment-letter-20130056.pdf.

[172] See http://www.fra.dot.gov/eLib/details/L04717.

damage in the past,[173] and recently, persistent and continued accidents involving crude transport by rail have garnered a significant amount of media attention.[174]

Yet, despite the unique characteristics of bitumen crudes and DilBit blends, including those characteristics which cause dramatic increases in corrosion in all refinery equipment components, the RDEIR avoids full analysis of the unique hazards accompanying rail transport, offloading, handling, storage, and processing of these crudes in its review of the Project's potential impacts.[175] As a result, the RDEIR's conclusions regarding the relative significance of the Project's impacts and its assessment of mitigation measures to address the same are inherently flawed.

a. The RDEIR Fails to Consider the Specific Hazard Risks Associated with the Transport of Tar Sands.

The RDEIR fails to consider the shift in crude slate when assessing the relative significance of the range of potential impacts caused by a crude oil spill. Rather than analyzing the simultaneous impacts from increased incidents of train car derailments and other accidental releases, and the corrosive effects of tar sand and DilBit blends as well as their unique challenges in cleanup, the RDEIR applies a quantitative estimation of train car accidents and derailments overall, and only mentions the potential risks associated with the Project's crude slate shift separately.

The RDEIR acknowledges throughout its analyses that implementation of the project "could result in spills at the Project Site due to mechanical failure, structural failure, corrosion, or human error during pipeline use and oil transportation to and from the rail spur."[176] Yet, it concludes that "given the low speed the trains would be moving at the site (3 mph) it is unlikely that a tank car could be impacted enough to result in a spill" and that "the most likely spill related event would [therefore] be a release during the unloading process due to a loading line failure."[177]

The segmentation of the categories of risk associated with potential train car derailments from the known significant risks caused by corrosive properties of tar sands and DilBit crudes, therefore, allows the RDEIR to conclude—erroneously and in contradiction of substantial evidence—that the hazards impacts are less than significant, and do not require mitigation. Because this conclusion and the methodology used to reach the conclusion are both inherently flawed, the RDEIR must be revised and re-circulated to address the errors in its significance findings for the Project's potential on-site hazards impacts.

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[173] For example, there was a very major spill into Upper Sacramento River in 1991. *See*, http://www.dfg.ca.gov/ospr/NRDA/Cantara.aspx.
[174] *See*, *e.g.*, *Accidents Surge as Oil Industry Takes the Train,* New York Times, Jan. 25 2014, available at http://www.nytimes.com/2014/01/26/business/energy-environment/accidents-surge-as-oil-industry-takes-the-train.html?hp&_r=1.
[175] *See supra* Part II.A.
[176] See e.g., RDEIR at 4.7-42
[177] See e.g., *id.* at 4.7-42

The RDEIR further ignores the fact that the change in crude slate enabled by the Project involves serious potential emissions of high level VOCs and hazardous air pollutants (HAPs) implicating severe public health impacts. As explained in detail in the comments submitted to the DEIR, diluents are comprised of low molecular weight organic material with a high vapor pressure, and contain high levels of VOCs, sulfur compounds, and HAPs.[178] These would be emitted during unloading, and would be contained in emissions from the crude tank(s) as well as fugitive components used to facilitate crude movement from transport and storage units, and into refining and process units, including those at the Rodeo facility.[179] The presence of diluent would increase the vapor pressure of the crude, substantially increasing VOC and HAP emissions from tanks and fugitive component leaks—all of which are not addressed the RDEIR.[180]

Moreover, these emissions would be highly prominent in any accidental releases caused by fire, explosion or other forms of accident, exacerbating the impacts of these incidents when they occur. Because the RDEIR fails to acknowledge, much less analyze or attempt to mitigate the potential impact from these emissions, it fails to comply with CEQA and must be revised and recirculated.

(ii) The RDEIR Fails to Discuss the Public Safety Risks of Refining a Different or Lower Quality Crude Oil Feedstock.

As noted above, a switch to a heavier oil feedstock necessarily implicates a greater risk of corrosion of refinery components.[181] This greater risk of corrosion was identified as a root cause of the August 2012 fire at the Chevron Richmond Refinery that sent 15,000 residents to local hospitals.[182] The RDEIR states explicitly that the Project will involve transporting heavy, higher sulfur-content crude, including tar sands crudes, yet it fails to adequately discuss the significant impacts resulting from this shift to a lower quality oil feedstock. As a result, the document precludes any meaningful analysis of the significant risks posed by this shift, including any identification or mitigation of the potential risks of catastrophic failure on par with what occurred at the Chevron Richmond Refinery in 2012 and any additional significant impacts to public health.

Tar sands blended crudes can lead to significant increases of all criteria pollutant emissions, as well as TAC and HAP emissions as a result of the increase in energy, and energy intensity required for processing and refining, and the increased risks associated with corrosion and potential accidents.[183]

As discussed above, while the RDEIR makes mention of potential increases in "emissions of toxic materials from fugitive emissions sources," caused by the Project, it fails to adequately

[178] *See* Attachment A, Fox Comment.
[179] See *id.*
[180] *See i.d.*
[181] *See supra* Part II.A; Fox Comments on Mitigated Negative Declaration of Valero Crude By Rail Project, Use Permit Application 12PLN-00063.
[182] *See* Chemical Safety Board, Chevron Richmond Refinery Interim Investigation Report, April 2013, available at: http://www.csb.gov/assets/1/19/Chevron_Interim_Report_Final_2013-04-17.pdf.
[183] *See* Fox Comments ("more energy will be required and more emissions produced to convert them into the same slate of semi-refined and refined products").

identify, analyze, and mitigate the full range of impacts caused by refining a significantly larger quantity of tar sands crudes at the SMR. The RDEIR improperly limits its analysis of the public health risks to the cancer risks analyzed in the HRA, and omits the public health hazards that would result from potential accidents, fires and other accidental releases caused by day-to-day project operations. Because the non-cancer risks are concerning and are potentially severe and the high sulfur and acid levels contained in these crudes and their semi-refined products dangerously accelerate corrosion of refinery components, contributing to equipment failure and causing more frequent accidental releases, these risks cannot remain undisclosed, without proper mitigation.

Moreover, because refining activities at the SMR are inherently linked to those which occur at the Rodeo facility and the Project has been improperly piecemealed from other related project, the RDEIR must account for increased emissions from refining tar sands crudes throughout the San Francisco Refinery.

Because the RDEIR fails to adequately analyze these impacts and state adequate mitigation to address them, it fails as an informational document and must be recirculated.

(iii) The RDEIR's Mitigation of Hazards is Inadequate.

The October 1, 2011 Department of Transportation (DOT) standards (also known as the "CPC-1232" standards) do not sufficiently minimize the risk of a hazardous material release involving Tar Sands crude:

> NTSB has long found that other features of DOT-111 tank cars, such as the bottom outlet valves, are inadequate and susceptible to breaches and has indicated that it is not convinced that the CPC-1232 modifications offer significant enough safety improvements. For its part, [Association of American Railroads] supports making additional modifications beyond the CPC-1232 standards by requiring that all tank cars carrying crude and ethanol have jackets, full-head shields, thermal protection and bottom outlet valve safeguards. BNSF officials have indicated that they would not have supported the consensus CPC-1232 standard in 2011 if they had known about crude oil at the time. They now believe the tank cars need to have a jacket and thermal protection in addition to the CPC-1232 upgrades, and have represented that these additional safeguards would increase tank car crashworthiness by another 50% over that afforded by the CPC-1232 standards.[184]

The RDEIR also relies on voluntary measures as assurance that derailments and accidents will be minimized, but there are no assurances of actual adherence to these measures. Moreover,

[184] *See* Earthjustice Petition to the Secretary of Transportation to Issue an Emergency Order Prohibiting the Shipment of Bakken Crude Oil in Unsafe Tank Cars (July 15, 2014), p. 16, *available at* http://earthjustice.org/sites/default/files/files/PetitionforEmergencyOrderReBakkenCrudeRailCars.pdf; *see also* "Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains," 79 Fed. Reg. 45,016 (Aug. 1, 2014) [noting safer specifications for tank cars].

nothing in the RDEIR indicates whether any of these measures actually apply to the railroads servicing the Project.

The RDEIR must perform a proper study of the risks of transporting tar sands crudes in particular, and it must require actual, specific, and enforceable measures to mitigate those risks.

(iv) The RDEIR's Analysis Illegally Defers Mitigation of Public Safety Precautions.

Formulation of mitigation measures should not be deferred until some future time.[185] Numerous cases illustrate that reliance on tentative plans for future mitigation after completion of the CEQA process significantly undermines CEQA's goals of full disclosure and informed decisionmaking.[186]

The RDEIR here relies on the hope, or anticipation, that both federal and state agencies will implement stronger standards for tank car safety regulations and other safety precautions to ensure a lower accident risk, and emergency plans to minimize damage when accidents do occur. While the RDEIR goes so far as to cite to some of these new, developing efforts, including those being developed by the Pipeline and Materials Safety Administration (PHMSA), the DOT, and the American Association of Railroads (AAR), it fails to assure the public and agency decisionmakers that such efforts will lead to any legally enforceable standards, applicable to the Project.[187] Moreover, in the event that such efforts do in fact materialize into legally enforceable requirements and/or standards, they are not legally enforceable at this time. Thus, to the extent the RDEIR sets forth such efforts in the context of its required mitigation measures, they constitute deferred mitigation and as such, are prohibited under state law.[188]

Though the RDEIR identifies four mitigation measures for the significant increase in risk of crude oil train derailment associated with the Project, all of these mitigation measures are qualified with a statement that "[t]he County may be preempted by federal law from implementing these measures."[189] The RDEIR then makes a general reference to the Interstate Commerce Commission Termination Act (ICCTA), but fails to undertake any analysis of ICCTA as it applies to the specific mitigation measures proposed by the RDEIR. By failing to analyze the preemption question with any degree of particularity, and instead relying on broad assumptions of preemption, the RDEIR illegally defers mitigation of the significant risks to public safety.[190] These impacts must be fully mitigated before any project approvals, and the Final EIR must include revisions to address these impacts.

Moreover, the RDEIR's analysis of the risk of train derailment is misleading because it is conducted entirely within the context of the DOT's proposed crude by rail safety regulations

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[185] CEQA Guidelines § 15126.4(a)(1)(b).
[186] *See eg. Cmtys. for a Better Env't v. City of Richmond*, 184 Cal.App.4th at 92.
[187] *See* RDEIR at 4.7-21 to -24.
[188] *See* RDEIR at 4.7-62 to -63 (Mitigation Measures HM-2a through -2d).
[189] RDEIR at 4.7-63.
[190] See also *supra* Part III.A.iv.a ("The DEIR Erroneously Purports that Mitigation is Preempted, Thereby Avoiding Critical Measures to Abate the Hazards and Impacts of Increased Crude by Rail Transport through California Communities").

which are not yet finalized and which present various options for new tank car design that offer varied degrees of improved safety.[191] Importantly, the rule is not yet finalized, and implementation of it will likely not occur for several years after the proposed project begins operation. Further, if the proposed project, as it states, largely imports heavy crude such as tar sands, the proposed federal DOT rule provides the SMR Project with little if any accident risk reduction benefits. That is because the proposed DOT rule assumes that the aging fleet of DOT111 tank cars will largely be shifted to tar sands service. As such, the proposed Project will not benefit from the safety improvements of the proposed rule's new tank car designs. Further, the federal DOT proposed rule estimates that 15 mainline crude rail accidents will occur each year and at least one catastrophic incident at least as large as Lac Megantic will occur at least every two years under the existing rail infrastructure network. Given that the proposed federal rules will not be finalized and implemented for several years, and that the proposed Project likely will not see many of the safety improvements required by the rule, the RDEIR must evaluate the risk of accidents and spills based on the hazards associated with existing rail infrastructure.

(v) The RDEIR's Analysis of Risk of Oil Spill and Train Derailment is Inaccurate and Misleading.

In its analysis of potential risks of hazards, accidents, and spills of over 100 gallons of oil, the RDEIR makes reference to incidents like the Lac Megantic disaster in July 2013, and a handful of others. Despite listing three additional accidents occurring since the Lac Megantic incident occurred less than sixteen months ago, the RDEIR erroneously concludes that there is a low probability that any accident, incident, or occurrence causing any damage or significant impact will occur. Moreover, the RDEIR finds that only those incidents causing 100 gallons or more of crude to spill merit consideration in the hazards analysis for the Project, because spills under 100 gallons are less likely to extend beyond the railroad right of way and less likely to produce explosions.[192] No further support is given to justify the 100 gallon cut-off, beyond these broad statements that more serious accidents are "unlikely" below 100 gallons.

The RDEIR's Quantitative Risk Assessments estimates that spills or other accidents resulting in the release of over 100 gallons of crude oil are likely to occur between once every 46 years and once every 76 years, depending upon the rail route.[193] However, this estimate relies on historical derailment data from 2003-2012, and does not include any of the catastrophic derailments from 2013 and 2014. As such, the probability of catastrophic events is artificially low, and the risk assessment must be re-analyzed in order to include more recent and representative data on derailments.

(vi) The RDEIR's Accident and Spill Risk Analysis is Flawed in Omitting Critical Data Reflecting Recent Increases in Crude by Rail Accidents and Releases.

The RDEIR's analysis of accident risk and magnitude of spills is flawed. First, the analysis in section 4.7 and Appendix H.2 only evaluates rail accident rates from 2003 to 2012

[191] RDEIR at Appendix H.2, 10-12.
[192] *See* RDEIR at 4.7-47.
[193] *Id*.

and touts that accident rates are declining.[194] However, those conclusions are misleading because they omit very relevant data. Accident rates in 2013 and 2014 specifically for crude by rail actually increased. In order to fully understand the risks of accidents for the proposed SMR crude by rail project the RDEIR must include this more accurate and up to date data in its analysis. The RDEIR should also look at similar data from Canada to obtain a more accurate assessment of crude accidents using existing rail infrastructure.

The RDEIR also evaluates spill release rates of all hazardous materials between 2005 and 2009.[195] This data is entirely unrepresentative of the current state of play for rail-based crude releases because it looks at all hazardous material spills and not crude specifically. It also omits recent data which is critical to analyzing the magnitude of potential spills. In 2013 alone more crude spilled from trains than spilled in the last four decades combined. The RDEIR cannot simply omit this data. Also, as stated in the U.S. Department of Transportation's proposed crude by rail safety rulemaking, the industry regularly underreports accident spill quantities. Thus, the RDEIR's conclusion that its analysis of accident and spill risk is "conservative" because, among other reasons, the railroad industry's overall accident rate is declining, completely misses the mark.[196] In fact, quite the opposite is true. If the RDEIR had included recent data specific to crude by rail accidents and spills, the results would likely show that the risk of an accident and spill quantities are much higher.

(viii) The RDEIR's Worst Case Scenario Spill Analysis is Flawed.

Finally, the RDEIR's worst case scenario spill analysis is also flawed. The RDEIR estimates a worst case spill of approximately 180,000 gallons, the capacity of approximately six tank cars.[197] This must be and error because we know that most crude trains are comprised of 80 to 100 or more tank cars each carrying approximately 30,000 gallons of crude. As such, a *worst case* scenario spill should evaluate the possibility of a spill that releases an entire unit train's crude capacity – an analysis on the order of at least 2.5 million gallons. The analysis of a worst case disaster should evaluate how such a spill would affect sensitive and critical ecosystems such as the San Francisco Bay watershed, drinking water sources for California residents, agricultural resources as well as urban downtowns. The worst case spill analysis also must look at the impacts of massive spills of different types of crudes that may be transported by the proposed project, including difficult to remediate tar sands crudes and highly volatile Bakken crudes. Indeed, this project cannot be approved without analyzing and mitigating its true impacts, including the true impacts of a worst-case disaster.

C. The DEIR Fails to Adequately Analyze the Project's Impacts on Local Agriculture and Water Quality and Supply.

(i) The RDEIR Underestimates Impacts to Agriculture.

[194] RDEIR at 4.7-4-13.
[195] RDEIR at Appendix H.2, 12.
[196] *Id*.
[197] RDEIR at 4.2-38; 4.7-47.

The Project would result in significant impacts to agriculture. As detailed immediately below, the RDEIR overlooks several of these impacts. It nevertheless does conclude that there will be a significant and unavoidable impact in the event of derailment along the mainline.[198] However, even that significance is again underestimated.

(a) Inadequate Analysis of Impact to Agriculture.

The RDEIR mistakenly concludes that, with mitigation, there will be no significant impacts to agricultural uses due to the Project's increased water usage, generation of dust, weeds, and increased risk of fire or oil spills.[199] Two principle errors of the RDEIR pervade this analysis: first, the RDEIR's failure to adequately assess the full scope of this Project and the impact of refining and transporting tar sands; and second, the RDEIR's inadequate mitigation responses due to unpersuasive assertions of federal preemption. The RDEIR's analysis, limited in scope, evidently limits the assessed impacts. As illustrated throughout this comment, the local impact of refining tar sands has a very different and significant local impact than assessed in the RDEIR. Furthermore, the artificially low bar set by the RDEIR's analysis to account for a risk of spill is also underestimated, thereby underestimating any resulting impacts, including those to agriculture. The mitigation measures proposed (WR-1, WR-2, AQ-1f and BIO-9) are wholly insufficient to address an impact whose severity is even wholly underestimated. The RDEIR must be revised to address these oversights.

(b) Conversion of Agricultural Rangeland to Industrial Use.

Agricultural impacts are considered significant if they impair the agricultural use of other property.[200] Instead of adhering to this clear mandate, the RDEIR provides a brief and unpersuasive analysis that the Project's appropriation of agricultural grazing land for the industrial purposes of the Project would not prove a significant impact.[201] In so doing, the RDEIR both ignores the impact of such displacement of agriculture for at least the next several decades, and forecloses the opportunity to address whether any feasible mitigation measures exist to address such a significant impact. The RDEIR must be revised to correct this deficiency.

(c) Displacement of Goods Required by Rail for Agriculture.

The RDEIR does not adequately address how increased traffic and deliveries of crude oil to the SFR will affect or displace the supply of goods required for agriculture by rail. This "common carrier" issue has arisen recently in the media, and the RDEIR should address this potential and evidently foreseeable impact.

(ii) The RDEIR Underestimates Impact to Water Quality and Supply.

An overall Project shift to refining tar sands at the SFR, a more energy intensive process than current operations, will increase water demand at the Santa Maria facility. That impact is

[198] *Id.* at 4.2-39.
[199] RDEIR at 4.2-35.
[200] RDDEIR at 4.2-19.
[201] RDEIR at 4.2-34.

unaddressed in the RDEIR. The RDEIR does address, however, the traditional problem of water availability in the Nipomo Mesa area.[202] The South County already suffers from low water levels. The Project's anticipated increase in water usage may jeopardize local water supply and the RDEIR should have addressed this potentially significant impact.

Similarly, as noted above, the water quality impacts and mitigation analysis in the RDEIR is based on an underestimated assessment of the frequency and severity of oil spill. This leaves unexplored and still significant impacts to surface water and groundwater quality. Moreover, the mitigation suggested to manage water quality impacts in the immediate vicinity of the Santa Maria facility is insufficient and would still result in a significant impact.

Mitigation measure WR-2 places the utmost confidence in the staff that implements the Santa Maria Refinery Spill Prevention Control and Countermeasure Plan ("SPCCP"). Essentially, the plan delivers a "first responder" approach that will reduce the impact of a spill in and around water sources that supply the Santa Maria facility to less than significant.[203] However, the RDEIR states elsewhere: "even with (first response) mitigation measures…impacts…could be significant."[204] Other unexplored variables include the volume and location of the spill and the amount of time before that first response.[205] The SPCCP is not laid out with sufficient specificity to provide any assurance that this water quality impact of the Project will be less than significant.

D. The RDEIR Fails to Adequately Analyze the Project's Impacts Related Biological Resources.

The RDEIR fails to adequately disclose, analyze, and mitigate many impacts to biological resources. Specifically, the RDEIR fails to adequately analyze and mitigate (i) impacts at the Project site from construction and operation of the Project; (ii) impacts outside of the Project site resulting from increased rail activity; and (iii) cumulative impacts from increased crude oil shipments.

(i) The RDEIR Fails To Adequately Analyze and Mitigate Impacts to Biological Resources at the Project Site from Construction and Operation.

The RDEIR fails to fully disclose, analyze, and mitigate many of the significant impacts to special-status species at the Project site resulting from construction and operation. Construction of the project would permanently destroy habitat and result in potential mortality for special-status species, including the highly imperiled Nipomo Mesa lupine. Project operation would result in significant new rail traffic at the Project site of up to 250 crude oil trains arriving each year, each carrying up to 80 oil cars, transporting a maximum of 53,532 barrels of crude oil per train.[206] This would result in a significant increase in the probability of oil spills at the Project site, in addition to increased impacts from train-related collisions, noise pollution, light pollution,

[202] See RDEIR at 4.10-4.
[203] RDEIR at 4.13-25.
[204] RDEIR at 4.2-39.
[205] *See id.* at 4.13-25.
[206] RDEIR at ES-5

and barriers to movement. The RDEIR fails to adequately analyze or mitigate many of these impacts, as detailed below.

(a) The RDEIR Fails To Adequately Analyze and Mitigate Many Construction and Operation-Related Impacts to Special-Status Species in the Project Area.

Under CEQA Guidelines, a project would cause significant adverse impacts to biological resources if it would "have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species."[207] Many Project impacts meet this threshold but were not adequately analyzed or mitigated in the RDEIR.

(1) Nipomo Mesa Lupine.

The Nipomo Mesa lupine *Lupinus nipomensis* is a federally and state-listed endangered species that is limited to one population comprised of approximately six colonies isolated along a two-mile stretch.[208] The species' habitat consists of stabilized backdune supporting central coastal dune scrub. Almost all the habitat for the species is located on the Santa Maria Refinery Property.[209] The Project would destroy 27.5 acres of undeveloped habitat,[210] including 26.5 acres of coastal scrub habitat.[211] As a result, Project construction would directly degrade and destroy some of the last-remaining habitat for the Nipomo Mesa lupine, and potentially destroy plants and seeds in the Disturbance Area. Project operation also significantly increases the risk of an oil spill that could kill individuals, destroy habitat, and potentially result in the extinction of species as acknowledged by the RDEIR.[212]

Although pre-project surveys did not detect plants at the Project site, the RDEIR admits that the survey data were not adequate to detect Nipomo Mesa lupine: "[t]he current determination of presence/absence of Nipomo lupine within the Project Site cannot be adequately determined…."[213] The RDEIR further acknowledges that "a seed bank has the potential to persist within the project site without producing any individuals,"[214] as verified by local species experts, the USFWS, and comments by scientific organizations. Because ground disturbances can stimulate germination of lupine, the RDEIR also acknowledges that construction activities could lead to a flush of plants at the Project site: "there is a potential for this species to occur within the Project site as a result of grading and construction activities associated with the Rail Spur Project."[215]

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[207] CEQA Guidelines, Appendix G.
[208] http://ecos.fws.gov/docs/five_year_review/doc3219.pdf
[209] Id.
[210] RDEIR at 2-7.
[211] RDEIR at 4.4-32
[212] RDEIR at 4.4-44
[213] RDEIR at 4.4-27
[214] RDEIR at 4.4-27
[215] RDEIR at 4.4-27

Although the RDEIR claims that the proposed mitigation measure BIO-1 is adequate to reduce the Project impacts to this highly imperiled species to "less than significant," mitigation under the RDEIR is inadequate in several key regards:

(1) The RDEIR should be revised to consider alternative locations for construction activities in order to avoid disturbing and destroying Nipomo Mesa lupine populations and suitable habitat.

(2) The RDEIR must implement mitigation measures even if the pre-project survey does not detect lupine. BIO-1 irrationally fails to implement mitigation if the pre-project survey does not detect lupine within the Project site.[216] However, the lack of detection in one additional pre-project survey is not sufficient to determine that the site is not occupied by lupine. Lupine can persist as an underground seed bank without producing above-ground individuals.[217] The seeds of the Nipomo Mesa lupine often require scouring in order for germination to occur, so there is a possibility that even with a normal rainfall season, the seeds may not germinate and produce above-ground individuals unless the seeds are scoured.[218] In addition, California is currently in severe drought and it may be several years before California receives "a normal rainfall season" as specified by the mitigation measure. In short, another survey that simply searches for blooming specimens may not prove sufficient to detect this endangered plant. Further, regardless of whether plants are detected, the Project is degrading and destroying a significant portion of remaining habitat for the Nipomo Mesa lupine, and this loss must be mitigated. The Nipomo Mesa lupine, like many annual plants, moves around on the landscape to take advantage of preferred ecological conditions, and occupies different sites from year to year. Thus, the Project site, even if not occupied by plants at present, may have been previously occupied and may be occupied in the future. Consequently, regardless of survey results, the RDEIR should proceed under the assumption that the Project will destroy currently occupied habitat or impact habitat that the lupine would occupy in the near future.

(3) Mitigation measure BIO-1 states that Phillips 66 will coordinate with the County and California Department of Fish and Wildlife (CDFW) to acquire a 2081 Incidental Take Permit (ITP) if the survey determines that the lupine is present. Because surveys may fail to detect species' presence and because the Project will permanently destroy some of the last-remaining habitat for the imperiled Nipomo Mesa lupine, Phillips 66 must apply for and acquire an ITP regardless of whether the survey detects individuals. The ITP must be acquired before certification of the RDEIR because mitigation measures, analyses, or consultation with the CDFW performed *after* certification of this DEIR constitutes *illegally deferred mitigation*.[219]

(4) Under the California Endangered Species Act, the issuance of ITP must ensure that the Project will not jeopardize the continued existence of a State-listed species.[220] . However, the RDEIR acknowledges that the Project has the potential to cause the extinction of the species due

[216] RDEIR at 4.4-28
[217] RDEIR at 4.4-27; USFWS letter at http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/NOPISCHECKLIST.pdf
[218] USFWS letter at http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/NOPISCHECKLIST.pdf
[219] *See Communities for a Better Environment* v. *City of Richmond* (2010) 184 Cal. App. 4th at 93.
[220] Cal. Code Reg. tit. 14, § 783.4(a)-(b).

to a major crude oil spill: **"**However, highly localized species such as Nipomo Mesa lupine, a federally endangered species, there is a potential that the entire population could be permanently lost or severely damaged in a catastrophic event."[221] Since the potential extinction of a species should be considered jeopardy and cannot be mitigated, the ITP, if issued, must include mitigation measures that will ensure that the Project will not jeopardize the Nipomo Mesa lupine. For example, measures could include the restoration and maintenance in perpetuity of multiple, sufficiently-large (i.e., with a range of microhabitats) suitable habitat areas with restored Nipomo Mesa populations at suitable distances from the Project and Refinery area to escape impacts from a worst-case-scenario oil spill.

(5) To compensate for the *permanent* impacts to Nipomo Mesa lupine and its habitat, the RDEIR should require Phillips 66 to restore and maintain high-quality habitat for the Nipomo Mesa lupine in perpetuity at a ratio *of a minimum* of 3:1, consistent with USFWS standards. Since 26.5 acres of dune scrub habitat would be damaged or destroyed by the Project, a minimum of 79.5 acres of habitat for the Nipomo Mesa lupine should be restored and maintained in perpetuity. This habitat must support restored Nipomo Mesa lupine populations and other native plant populations, and should be maintained in addition to, and not overlapping with, the 53 acres of restored scrub dune habitat specified under the Dune Habitat Restoration Plan. As discussed above, restored habitat areas should be protected from the effects of a worst-case-scenario oil spill from the Project and Refinery. Further, there must be dedicated, long-term funding for the maintenance of the habitat in perpetuity, including long-term monitoring and management of invasive species.

(6) Construction on the Project site may lead to the germination of Nipomo Mesa lupine in the construction zone. The RDEIR must include mitigation measures to identify occurrences of lupine at the construction site and have detailed protocols to protect these individuals.

(7) Because a lupine seed bank is likely present at the Project site, the RDEIR should require that topsoil be removed and stockpiled prior to construction to preserve the seed bank. Consultation should occur with USFWS, CDFW, and other experts to determine how to protect and utilize the seed bank.

(2) Silver Dune Lupine-Dune Heather Shrubland Alliance.

The RDEIR fails to evaluate Project impacts on the imperiled Silver Dune Lupine-Dune-Heather Shrubland Alliance, also called the Silver Dune Lupine-Mock Heather Scrub Alliance,[222] which is comprised of silver dune lupine (*Lupinus chamissonis*) and dune-heather (*Ericameria ericoides*). This plant alliance is listed as G3 S3 and is tracked by the CDFW. The RDEIR fails to disclose that two large areas inhabited by this rare alliance are located immediately adjacent to the Disturbed Area along a ~750 foot border.[223] Due to the proximity of this sensitive plant community to Project construction and operation-related activities, the RDEIR must evaluate the direct and indirect impacts to this alliance from the Project.

[221] RDEIR at 4.4-44.
[222] https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=24716&inline=1 at PDF page 50
[223] RDEIR at Figure 4.4-3

(3) Sensitive Ground-Dwelling Animal Species.

The American badger, coast horned lizard, and slivery legless lizard are among the special-status species which will suffer permanent habitat loss due to the Project and which will either be evicted (badger) or translocated (lizards) from the Project site. Translocation often leads to mortality, and the mitigation measures BIO-3 and BIO-4 do not require any standards for the quality of the relocation sites or monitoring of translocated individuals to determine if these individuals survive. To mitigate for the loss of habitat and potential mortality of these species, the RDEIR should require a minimum of 26.5 acres of suitable habitat be provided, restored, and maintained in perpetuity for these species before the Project is approved. The RDEIR should also require that relocation sites meet species-expert-approved standards to ensure maximum survival probability for translocated individuals.

(4) Burrowing Owl.

Mitigation measures BIO-8a and BIO-8b must follow the full recommendations of the 2012 CDFW Staff Report on Burrowing Owl Mitigation,[224] including survey protocols, buffer area distances for burrows, and vegetation management protocols for mitigation lands.

(b) The RDEIR Fails to Analyze and Mitigate Many Impacts From Increased Rail Traffic at the Project Site.

The RDEIR fails to analyze and mitigate many operational and construction-related impacts at the Project site to special-status species, including impacts from collisions, noise pollution, light pollution, and barriers to movement imposed by Project construction and increased rail activity. The RDEIR must evaluate and mitigate the full range of construction-related and operational impacts to special-status species in the Project area.

(c) The RDEIR Fails to Adequately Analyze and Mitigate Impacts From Oil Spills at the Project Site.

The RDEIR states that the impacts of an oil spill at the Project site are less than significant with mitigation. However, the analysis and mitigation of oil spill impacts at the Project site (BIO-7) are wholly inadequate in several key regards:

(1) The RDEIR does not contain sufficient analysis and mitigation for oil spills resulting from the pipeline. First, the RDEIR contains contradictory statements about the volume of a worst-case spill from the pipeline, which it estimates at 11,000 gallons of crude oil in Section 4.4[225] and at 90,800 gallons in Section 4.7,[226] which is an enormous discrepancy that must be corrected. Second, the RDEIR states that spills along the pipeline outside of the unloading rack "would be contained with an existing road."[227] However, the RDEIR appears to provide no explanation of how a spill would be contained by the road. The RDEIR must provide clear

[224] http://www.dfg.ca.gov/wildlife/nongame/docs/BUOWStaffReport.pdf
[225] RDEIR at 4.4-38
[226] RDEIR at 4.7-43
[227] RDEIR at 4.4-38

mitigation measures to contain a worst-case scenario from the pipeline, if these impacts are to be considered less than significant with mitigation.

(2) The RDEIR remains inadequate in not fully addressing the scope of the company's shift to a different quality of crude oil feedstock and its impacts to biological resources. The shift in feedstock to tar sands oil must be addressed to properly analyze and mitigate impacts to biological resources. It is well-documented that the probability, severity, and consequences of an oil spill depend directly on the chemicals in the crude. Some types of crudes are more challenging to contain and clean up in the event of spill. For example, tar sands crude is heavy, and sinks to the bottom of water bodies that it is spilled into, which is detrimental to aquatic species. Tar sands oil is not only dangerous for its inherent corrosive and acidic properties and for its tendency to sink in water bodies, but because it is generally only transported when blended with toxic "diluents" that are mixed with the viscous tar sands in order to make it more fluid. Spills of heavy, "sinking" crude, like tar sands oil, are notoriously difficult and expensive to clean up, and create lasting and perhaps irreversible impacts to water quality and aquatic ecosystems.[228] Accordingly, the RDEIR must require mitigation measures that address the containment, cleanup, and restoration of oil spills resulting from the crude oil types that the Project will transport and process, such as Canadian tar sands oil.[229]

(3) Mitigation Measure BIO-7 requires Phillips 66 to amend and submit for review and approval to the County Planning Department, its Santa Maria Refinery Spill Prevention, Control and Countermeasure Plan. This amendment and review has not yet occurred, and will not occur until after the close of the CEQA process. However, CEQA requires that formulation of mitigation measures not be deferred until some future time.[230] Numerous cases illustrate that reliance on tentative plans for future mitigation after completion of the CEQA process significantly undermines CEQA's goals of full disclosure and informed decision making.[231] As such, an EIR cannot rely on any management plans, studies, or reports developed after the EIR process.[232] Thus, this mitigation measure cannot comply with CEQA until the County has had an opportunity to review, approve and include that Countermeasure Plan in a revised document.

(ii) The RDEIR Fails To Properly Analyze and Mitigate Impacts to Biological Resources Outside of the Project Site.

The RDEIR's analysis of Project impacts to biological resources outside the Project site suffers from numerous fatal flaws: (1) the RDEIR arbitrarily limits the geographic scope of its off-site biological resources impacts analysis; (2) the RDEIR fails to require sufficient mitigation measures to reduce the impacts of oil spills along the UPRR mainline serving the Project; and (3) the RDEIR fails to analyze and mitigate the impacts from collisions, noise pollution, light pollution, and barriers to movement from increased rail traffic on the rail lines serving the Project.

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[228] http://response.restoration.noaa.gov/about/media/oil-sands-production-rises-what-should-we-expect-diluted-bitumen-dilbit-spills.html
[229] RDEIR at Table 2.6
[230] CEQA Guidelines § 15126.4(a)(1)(b).
[231] *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal. App. 4th 70, 92 .
[232] *Id.*

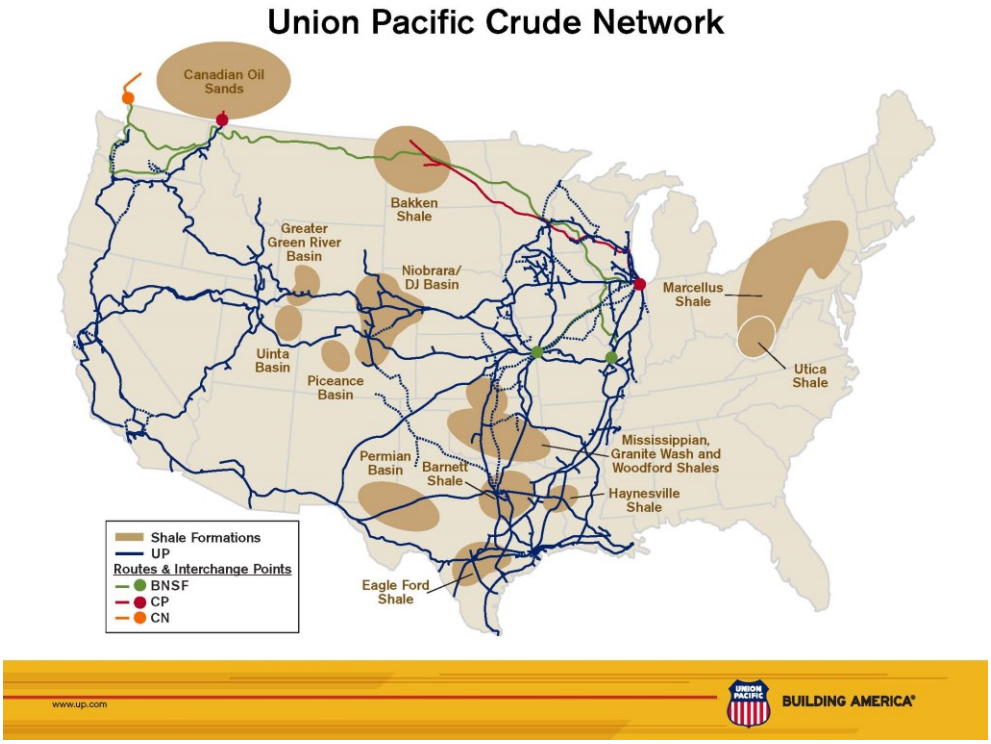
(a) The RDEIR Limits the Geographic Scope of its Off-Site Biological Resources Impacts Analysis.

The RDEIR limits its analysis of the impacts from a crude oil spill along the UPRR mainline to the section of track between the Roseville and Colton rail yards. However, CEQA requires an EIR to discuss the significant impacts that the proposed project will have in the relevant geographic area.[233] Agencies must "provide a reasonable explanation for the geographic limitation used,"[234] and the geographic scope "cannot be so narrowly defined that it necessarily eliminates a portion of the affected environmental setting."[235]

Although the RDEIR labels routes beyond the Roseville and Colton rail yards as speculative, very few branches of the Union Pacific railroad connect crude oil sources to the Project site within California and other Western states. For example, as illustrated in the map below, there are two main rail routes between the Project site and Canadian tar sands sources to the north. Because only a handful of rail lines would serve the Project, the analysis of the potential impacts to special-status species along the UPRR mainlines serving the Project is eminently feasible and foreseeable. As such, the RDEIR must analyze the impacts to special-status species along the mainline beyond the Roseville and Colton yards. This failure is arbitrary and violates CEQA.

Union Pacific Crude-By-Rail Lines.
Source: http://www.up.com/customers/chemical/crude/index.htm

[233] CEQA Guidelines § 15126.2(a).
[234] *Id.* § 15130(b)(1)(B)(3).
[235] *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal. App. 4th 1184, 1216.



(b) The RDEIR's Mitigation Measures are Inadequate to Reduce the Significant Impacts of Oil Spills Along the UPRR Mainline Serving the Project.

The RDEIR classifies the impacts from crude oil spills along the mainline as significant and unavoidable. The tremendous potential for harm is illustrated by the fact that oil spills along the limited section of mainline track between the Roseville and Colton rail yards could impact an estimated 167 sensitive plant species, 219 sensitive animal species, 411 streams and wetlands, 26 waterbodies and 578 wetlands, and 20 sensitive habitats, just within 300 feet of the mainline.[236] As noted by the RDEIR, "depending on the location of an oil spill along the UPRR mainline tracks, there may be no oil spill containment or cleanup equipment immediately available, and it could take some time for emergency response teams to mobilize adequate spill response equipment."[237] This analysis highlights the high probability for significant damage from an oil spill along the UPRR mainline track serving the Project. However, the proposed mitigation measures are completely inadequate. BIO-11 is simply not adequate to lessen the impacts of an oil spill to biological resources. Further, as discussed above, the proposed mitigation measures for the significant increase in risk of crude oil train derailment and spills are also inadequate because the RDEIR (1) applies flawed, under-estimated assumptions regarding the increased risks of crude oil spill(s) and resulting impacts, caused by the Project; (2) fails to adequately analyze the implications of a shift in crude slate on impacts; and (3) illegally defers mitigation in

[236] RDEIR at 4.4-44 to -45.
[237] RDEIR at 4.4-46.

relying on safety precautions and anticipated plans that will not be implemented within a reasonable time.

(c) The RDEIR Fails to Analyze and Mitigate the Impacts From Collisions, Noise Pollution, Light Pollution, and Barriers to Movement Due to Increased Rail Traffic on the Rail Lines Serving the Project.

Although the Project will vastly increase rail activity by up to 250 oil trains trips per year, with the potential for 500 total train trips per year when departures from the refinery are considered (i.e., the same trains coming and leaving), the RDEIR fails to sufficiently analyze the full range of off-site impacts from increased rail traffic to wildlife species along the rail lines serving the Project. Scientific studies have documented that train activity negatively affects wildlife through (1) mortality from collisions with trains; (2) disturbance from noise and artificial light causing stress and behavioral changes; (3) impeding natural movements, thereby restricting the animal's range, making habitat less accessible, and potentially leading to population fragmentation and isolation; and (4) pollution of the physical, chemical, and biological environment, for example through the emissions of contaminants like heavy metals, which can degrade habitat suitability in a much wider zone than the width of the railroad itself.[238] Each of these impacts would be worsened by the significantly increased rail traffic resulting from the Project. The RDEIR must analyze and mitigate each of these impacts along the rail lines serving the Project both within and outside of California. The RDEIR's failure to address these important topics violates CEQA.

1. Mortality From Train Collisions.

Mortality resulting from animal-train collisions has been documented for a wide range of species, including moose,[239] grizzly bears,[240] black bears,[241] wolverines,[242] wolves,[243] deer,[244] pronghorn,[245] tortoises,[246] amphibians,[247] and birds.[248] The frequency of train trips was determined to be the most significant factor in the number of deer-train collisions across study sites.[249] Railroad fatalities can have detrimental impacts on animal populations. For example, train-moose fatalities in the lower Susitna Valley, Alaska, were a primary contributor to population reductions which ranged up to 35% per year.[250]

The BNSF railway in northwestern Montana has long been responsible for killing threatened grizzly bears from the Northern Continental Divide Ecosystem (NCDE) population.

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[238] Jackson 1999.
[239] Andreassen et al. 2005, Gundersen and Andreassen 1998, Gundersen et al. 1998.
[240] Benn and Herrero 2002, Waller and Servheen 2005, Pissot 2007, USFWS 2013.
[241] Pace et al. 2000, Van Why and Chamberlain 2003.
[242] Krebs et al. 2004.
[243] Morner et al. 2005.
[244] AP 2014, Kusta et al. 2011, Kusta et al.2014.
[245] AP 2011.
[246] Iosif 2012.
[247] Budzik and Budzik 2014.
[248] Spencer 1965.
[249] Kusta et al. 2014.
[250] Becker and Grauvogel 1991, Modafferi 1991.

According to recent data, 50 grizzly bears from the NCDE population were documented as killed by train collisions between 1984 and 2013.[251] In 2014 at least two grizzly bears from this threatened population were killed by train collisions.[252] Although BNSF has taken some steps to clean up grain spills attracting bears, grizzly bears continue to be killed along this section of railroad, which has been attributed in large part to the high volume of rail traffic on this line:[253]

> Historically, grizzly bears have been attracted to the railroad by grain that leaked from cars along the tracks or that accumulated at sites of repeated derailments, and grizzly bears have been struck and killed by trains at these sites. Since the mid 1990s, BNSF has been largely successful in cleaning up and reducing the occurrence of grain spills, however, grizzly bears continue to be killed along this section of railroad. Our GPS data did not show any concentrated relocations on the railroad tracks that suggested the presence of an attractant. This research suggests that the coincidence of high rail traffic volume, low highway traffic volume, and natural grizzly bear movement patterns may be partially responsible for the observed patterns of mortality.[254]

As a result, the average number of grizzly bear deaths from train collisions has not declined over time.[255]

2. Noise Pollution.

Noise from rail activity has been found to cause adverse impacts to species. Chronic noise pollution from road, rail, and other anthropogenic activity is an issue of increasing concern.[256] Birds are particularly vulnerable to noise because it can mask their vocal communication, with consequent effects on their health and survival. Schroeder et al. (2012) documented reduced reproductive fitness in birds exposed to chronic noise from generators. Intermittent noise, the expected pattern along a rail line, may also cause stronger effects and decrease the ability of birds to habituate to noise.[257] While some birds may utilize vocal adjustments in response to chronic noise pollution, those adjustments are likely to have direct and indirect fitness costs.[258]

3. Barriers to Movement.

Railways can act as barriers to movement that can result in population fragmentation and isolation. Increased train traffic can increase the impact of the barrier. For example, studies indicate that railways act as a barrier to movement for the federally threatened grizzly bear population in the Northern Continental Divide Ecosystem (NCDE) in northwest Montana.[259]

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[251] USFWS 2014.
[252] Daily Inter Lake 2014.
[253] Waller and Servheen 2005.
[254] Waller and Servheen 2005: 997.
[255] USFWS 2014.
[256] Morley et al. 2014.
[257] Blickley et al. 2012.
[258] Read et al. 2014.
[259] Waller and Servheen 2005, Kendall et al. 2009.

Kendall et al. (2009) found evidence for population fragmentation across the western side of the BNSF rail line and Highway 2 corridor between Glacier National Park and National Forest lands. Population differentiation across the corridor indicated that reduced genetic interchange was occurring. Waller and Servheen (2005) similarly found that train traffic posed a significant movement challenge for bears. Furthermore, their research indicated that the high rail traffic volume was particularly problematic for bear mortalities:

> While grizzly bears appeared to make behavioral adjustments to temporal patterns of highway traffic volume, they were faced with a different situation along the railroad. During hours of low highway traffic, when grizzly bears were choosing to cross US-2, railroad traffic was high. Trains were more frequent, longer, and faster at night than during daylight hours. Furthermore, rail traffic was greater during fall when bears were in hyperphagia. This situation arose for a number of reasons. First, most track maintenance work was accomplished during daylight hours; thus, freight traffic was often curtailed during the day to allow track work to proceed. Second, arrival times for freight trains depended partially on their departure time. Freight trains loaded on the Pacific coast (approx 800 km to the west) during the day left in the evening and arrived in our study area at night the next day, 24–36 hr later. The result was that grizzly bears had to contend with high railroad traffic when highway traffic was lowest. We observed greater grizzly bear mortality caused by trains than that caused by cars on the highway.[260]

Railroads have also been shown to inhibit movement of bumblebees[261] and pronghorn.[262] Fenced railroads in Arizona posed movement barriers that isolated pronghorn into different populations and shaped home ranges, resulting in population fragmentation.[263]

(iii) The RDEIR Fails to Adequately Analyze and Mitigate Cumulative Impacts of Increased Crude Oil Shipments on Biological Resources.

The RDEIR acknowledges that the cumulative impact of an oil spill from the Project and the other crude oil shipment projects listed in Table 3-1 would be significant and unavoidable.[264] The RDEIR should have similarly analyzed the cumulative impacts from recent, current, and proposed projects on the risk of collisions, noise pollution, light pollution, barriers to movement, and other impacts resulting from increased rail activity along the mainline track serving the Project.

E. The Project is Inconsistent with State and Local Plans.

[260] Waller and Servheen 2005: 997.
[261] Bhattacharya et al. 2003.
[262] Ockenfels et al. 1997.
[263] *Id.*
[264] RDEIR at 4.4-49

An EIR must discuss any inconsistencies between the proposed project and applicable general plans, specific plans, and regional plans.[265] This necessarily includes the County of San Luis Obispo's General Plan and other applicable state and federal regulations.

The RDEIR fails to adequately discuss potential inconsistencies with applicable plans, policies, and regulations, including (1) the San Luis Obispo County General Plan, (2) Contra Costa County's Industrial Safety Ordinance, (3) the United States Chemical Safety Board, OSHA regulations, and other federal guidance regarding risk analysis and hazards prevention, and (4) the California Global Warming Solutions Act (AB 32).

The San Luis Obispo County General Plan sets forth goals to improve the environment, based on public, community-based input from County Residents. The Plan sets forth goals relating to the community's expressed needs to see a decrease in air pollution, decrease in traffic and traffic related noise, and decreased industrial development.[266] The Project, however, will increase all of those issues, wholly conflicting with the General Plan's over-arching environmental goals. Indeed, the RDEIR notes in the Appendix G that the Project is potentially inconsistent with ten of the General Plan's policy goals, including reducing air pollution, minimizing toxic exposures, limiting risks to public safety, promoting development of renewable energy resources, and preventing exposures to hazardous substances.[267] In addition to being inconsistent with the County's General Plan, the Project is also incompatible with surrounding land uses—most importantly, with surrounding residential land uses, where the Project would significantly increase cancer health risks, even with mitigation measures in place.[268]

Additionally, because this Project is integrally related to the Propane Fuel Recovery Project at the Refinery's Rodeo facility, and because the two facilities are connected by pipeline, what takes place at the Santa Maria facility impacts the Rodeo facility, triggering Rodeo and Contra Costa County Local Plans and Ordinances. By increasing regional and state processing of and reliance on fossil fuels, the Project conflicts with Contra Costa County's General Plan, to the extent that plan sets goals to increase the usage of renewable energy such as wind and solar.[269] The Project's switch to denser, higher sulfur crude also conflicts with the Contra Costa County Industrial Safety Ordinance's Inherently Safer Systems requirement.[270]

Further, in order to provide such an adequate investigation and discussion of potential impacts of refining a lower quality oil feedstock as required by CEQA,[271] it would be reasonable for decisionmakers to determine consistency with federal recommendations addressing the same shift in industry practice. The Project as proposed in the RDEIR fails to meet such federal

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[265] CEQA Guidelines § 15125(d).
[266] SLO County General Plan, Adopted: August 1994, Revised: June, 2010, Chapter 1, Land Use, available at: http://www.slocity.org/communitydevelopment/download/unifiedgeneralplan/Chapter1-Land%20Use%20June2010.pdf.
[267] *See* RDEIR App. G, Table G-1.
[268] *See* RDEIR at 4.3-65, Figure 4.3-7.
[269] *See generally*, Contra Costa County General Plan, 2005-2020, Adopted January 18, 2005, Reprinted July, 2010, available at: http://contra.napanet.net/depart/cd/current/advance/GeneralPlan/General%20Plan.pdf.
[270] *See* Contra Costa County Ordinance Chapter 450-8, available at http://cchealth.org/hazmat/pdf/iso/2006_iso_official_code_complete.pdf.
[271] CEQA Guidelines § 15125(c).

guidance. In addition, the Project as proposed also fails to meet the requirements of the State's GHG reduction goals.

As noted above, the U.S. Chemical Safety Board (CSB) has explicitly addressed the increased risks of corrosion in refineries due to refining a heavier oil feedstock. In particular, the CSB has identified the risk of catastrophic and hazardous failure from running higher sulfur crude in existing refineries built before 1985.[272] The CSB also found that such sulfur corrosion is not a new phenomenon, and that the petroleum industry is well aware of its potential to cause serious impacts on refinery equipment.[273] The RDEIR fails to recognize the CSB's analysis and fails to address the proposed recommendations made by the CSB. The RDEIR should be revised to properly address similar and foreseeable issues of corrosion as identified at the Chevron Richmond Refinery, which lead to the catastrophic August 2012 Chevron Richmond Refinery fire.[274]

Moreover, because there will be an increase in the presence of harmful chemicals, raising serious safety and hazards concerns, the Project has the potential to conflict with the Occupational Health and Safety Act (OSHA) employee protection standards, as well as the President's August 2013 Executive Order (EO) to improve chemical safety and security.

Finally, the Legislature has established that "[g]lobal warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California."[275] With AB 32, California has set its objective to meet 1990 emission levels of GHGs by 2020. The RDEIR's analysis does not provide enough information regarding whether the Project will meet such a state priority. The RDEIR's analysis does not provide enough information regarding whether the Project will meet such a state priority. In particular, "the increase in emissions of criteria pollutants and greenhouse gases from most fired sources due to tar sands bitumen derived semi-refined products refined at Rodeo should have been included in the emission inventory for the Rail Spur Project."[276] Absent this data, it is impossible for the RDEIR to describe whether the Project will meet, or even hinder, California's GHG reduction goals. Although the RDEIR includes a thorough discussion of California's regulatory framework to combat climate change,[277] without a sufficient GHG analysis, no decisionmaker can come to any sensible conclusion regarding how the impacts of this Project affect those goals.

The RDEIR fails to address the above examples of the Project's conflicts with local, State and Federal plans. Given this fundamental failure, the RDEIR should be redrafted and recirculated with a complete discussion of Project inconsistencies with applicable plans, policies, and regulations.

V. THE RDEIR FAILS TO ADEQUATELY ANALYZE THE PROJECT'S CUMULATIVE ENVIRONMENTAL IMPACTS.

[272] *See* Chemical Safety Board, Chevron Richmond Refinery Interim Investigation Report, April 2013, available at: http://www.csb.gov/assets/1/19/Chevron_Interim_Report_Final_2013-04-17.pdf
[273] *Id*., at 15.
[274] *See* Chemical Safety Board, Chevron Richmond Refinery Interim Investigation Report, April 2013, *supra*.
[275] Assembly Bill (AB) 32, California Global Warming Solutions Act, Cal. Health & Safety Code § 38501(a).
[276] Fox Revised Santa Maria Report at 13.
[277] RDEIR at 4.3-29 to -32.

Once again, the RDEIR hides behind an unpersuasive assertion of federal preemption in order to avoid an analysis and possible future application of more realistic, feasible and beneficial mitigation measures. It does this by again focusing simply on cumulatively relevant locomotive operations.[278]

However, CEQA requires an EIR to discuss all of a Project's significant cumulative impacts.[279] A legally adequate cumulative impacts analysis views a particular project over time and in conjunction with other related past, present, and reasonably foreseeable future projects whose impacts might compound or interrelate with those of the project at hand. "Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."[280] These projects do not have to be from the same class of project.

A project has a significant cumulative effect if it has an impact that is individually limited but "cumulatively considerable."[281] "Cumulatively considerable" is defined as meaning that "the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects."[282] Cumulative impacts analysis is necessary because "environmental damage often occurs incrementally from a variety of small sources [that] appear insignificant when considered individually, but assume threatening dimensions when considered collectively with other sources with which they interact."[283] The RDEIR fails to meet this requirement by unnecessarily limiting its analysis of potential sources of cumulative impacts. Just like the overall analysis underlying the RDEIR, this is not simply a transport infrastructure project. The other crude by rail projects listed in the RDEIR are also not simply transport infrastructure projects. All of these projects reflect the industry intention to switch to a lower quality of crude oil feedstock. Those create different and greater degrees of pollution that any environmental document must analyze cumulatively. The RDEIR's analysis focuses solely on cumulative impacts associated with that narrower transport element, or, the locomotive and associated emissions, for instance, increased traffic on the railway mainline. Foreseeable emissions include increased operational emissions from the inevitable refining of that lower quality oil feedstock transported.

In addition, even the list of reasonably foreseeable future projects, including other crude by rail projects considered in the RDEIR is under inclusive, especially in light of the potential geographic scope of certain potentially significant impacts. Although the RDEIR mentions some of the current crude by rail projects and proposals, and purports to analyze the cumulative environmental impacts from them, it does not come close to disclosing the full scope of the staggering environmental impacts they will have on California.[284] The RDEIR's Table 3.1 purports to disclose cumulative projects to a sufficient degree.[285] It does not.

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[278] RDEIR at 4.3-76.
[279] CEQA Guidelines § 15130(a).
[280] CEQA Guidelines § 15355(b).
[281] *Id*. §§ 15065(a)(3), 15130(a).
[282] *Id*. § 15065(a)(3).
[283] *Communities for a Better Env't v. Cal. Res. Agency* (2002) 103 Cal.App.4th 98, 114.
[284] *See* RDEIR Table 3.1.
[285] RDEIR at 3-3.

Five other projects omitted from adequate consideration in the RDEIR's analysis of cumulative environmental impacts include[286]:

(i) **Phillips 66 Ferndale, Washington Crude Unloading Facility Project.**

Phillips 66 was recently issued a permit to construct a new crude rail unloading facility at its Ferndale Refinery in Washington. The RDEIR must state whether this Project anticipates, depends on, or is in any other way related to the Washington project.

(ii) **Phillips 66 Rodeo Propane Fuel Recovery Project.**

In particular, despite the clear relationship between the Santa Maria projects and the Rodeo Refinery project described above, the RDEIR fails to evaluate the Project's cumulative impacts of Santa Maria semi-refined products in Rodeo. These include a cumulatively considerable increase in criteria and toxic air contaminant air emissions and greenhouse gas emissions, and the cumulative environmental impacts of refining increased volumes of tar sands at the SFR.

(iii) WesPac Pittsburg Energy Infrastructure Project.

WesPac Energy–Pittsburg LLC (WesPac) proposes to modernize and reactivate the existing oil storage and transfer facilities located at the NRG Energy, Inc.(NRG, formerly GenOn Delta, LLC) Pittsburg Generating Station. The proposed WesPac Energy– Pittsburg Terminal (Terminal) would be designed to receive crude oil and partially refined crude oil from trains, marine vessels, and pipelines, store oil in existing or new storage tanks, and then transfer oil to nearby refineries, including the Phillips 66 San Francisco Refinery's Rodeo facility.[287]

The Terminal Project consists of the modernization and reactivation of the following components at the NRG facility: (1) marine terminal; (2) onshore storage terminal, including both East and South Tank Farms; and (3) the existing San Pablo Bay Pipeline. In addition, the project consists of the construction and operation of new facilities, including: (1) Rail Transload Facility; (2) Rail Pipeline; (3) KLM Pipeline connection; and (4) new ancillary facilities, including an office and control building, warehouse, electrical substation, and others as described below.[288]

For the delivery of crude oil and partially refined crude oil by train, a new Rail Transload Operations Facility would be constructed on a 9.8-acre vacant rail yard, to be leased from BNSF Railway Company. All products handled at the facility would be transported by rail, ship, barge, or pipeline; no products would be transported by truck as part of the proposed project.[289] The Terminal would operate with an average throughput of 242,000 barrels (BBLs)1 of crude oil or partially refined crude oil per day, and would have a maximum capacity throughput of 375,000

[286] This list does not include the nearby oilfield expansion project proposed by Freeport McMoran, which is under construction and discussed in the Fox Santa Maria Report.
[287] WesPac RDEIR at 2.0-1.
[288] *Id*. at 2.0-4.
[289] *Id*. at 2.0-1.

BBLs per day.[290] The total annual throughput for the entire Terminal would be approximately 88,300,000 BBLs of crude oil and/or partially refined crude oil per year.[291]

As mentioned above, the SFR is one of the refineries that may receive crude oil and/or deliver-crude oil to the Terminal.[292] Although the RDEIR *lists* this project in Table 3.1, it still fails to include any adequate *analysis* of the WesPac project in the cumulative impact analysis (outside of anticipated rail traffic). Nevertheless, the physical construction and *operation* of this facility will contribute to cumulative environmental impacts and because it could facilitate greater amounts of not just crude delivered to or from the SFR, but a lower quality crude with associated increased emissions and hazards delivered to or from the SFR. The RDEIR must be revised to take into account each of the cumulative projects that has the potential to result in cumulatively considerable environmental impacts. Furthermore, the RDEIR must identify feasible mitigation measures capable of reducing all of the Project's associated and foreseeable environmental impacts.

(iv) Kinder Morgan Richmond Terminal.

The RDEIR omits any mention of the Kinder Morgan terminal in Richmond, California. The RDEIR also omits any discussion of the possibility of ship to rail deliveries of crude oil feedstock, which would directly implicate deliveries to the Port of Richmond and then to the SFR via the Kinder Morgan facility. The cumulative impact of this terminal would be utterly foreseeable, and the RDEIR should have analyzed this possibility, and at a minimum, the additional cumulative impact the Project would add to the emissions of toxic air contaminants, GHGs, or other pollutants, or increase in hazards in conjunction with operation of the Kinder Morgan terminal's existing transport of crude by rail.

(v) Phillips 66 Pipeline Project.

Table 3.1 also discloses the Phillips 66 Pipeline Project. The proposed project would transport crude oil from the Arroyo Grande oil field to the Santa Maria Facility.[293] The RDEIR's cumulative impacts analysis must analyze whether this Project would displace the need for this other source of crude oil feedstock for the SFR.

A. Climate Change Implications.

Furthermore, it is important to acknowledge that climate change is the classic example of a cumulative effects problem; emissions from numerous sources combine to create the most pressing environmental and societal problem of our time.[294] As one appellate court recently held, "the greater the existing environmental problems are, the lower the threshold for treating a project's contribution to cumulative impacts as significant."[295]

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[290] *Id*. at 2.0-2.
[291] *Id*.
[292] *Id*.
[293] RDEIR at 3-4.
[294] *Kings County Farm* ("Perhaps the best example [of a cumulative impact] is air pollution, where thousands of relatively small sources of pollution cause serious a serious environmental health problem.").
[295] *Communities for Better Env't v. Cal. Res. Agency* (2002) 103 Cal. App. 4th 98, 120.

Canadian tar sands crude is considered to be the dirtiest, most carbon-intensive fuels on the planet. NASA climatologist Jim Hansen explains:

> With today's technology there are roughly 170 billion barrels of oil to be recovered in the tar sands, and an additional 1.63 trillion barrels of worth underground if every last bit of bitumen could be separated from sand. "The amount of CO2 locked up in Alberta tar sands is enormous," notes mechanical engineer John Abraham of the University of Saint Thomas in Minnesota, another signer of the Keystone protest letter from scientists. "If we burn all the tar sand oil, the temperature rise, just from burning that tar sand, will be half of what we've already seen"—an estimated additional nearly 0.4 degree Celsius from Alberta alone.

Notwithstanding the clear evidence documenting the effect that petroleum-refining has on GHG emissions, and enormous increase that would result from the transport, processing and refining of tar sands crudes. The RDEIR should have acknowledged the complete degree of the company's switch to this different quality crude oil feedstock and provided a suitable cumulative impacts analysis.

B. Environmental Justice Implications – A Tremendous Cumulative Impact on an Already Over-Burdened Community

Finally, it is important to note the cumulative impact of pollution on the local community. As illustrated throughout this comment, this Project as proposed will increase pollution locally, essentially relying on ERCs to mitigate a majority of pollution that occurs locally. Increased emissions in the impacted Project area will inevitably result in greater cumulative impacts especially for the communities surrounding the refinery. Santa Maria, its surrounding communities including the cities of Nipomo and Guadalupe, as well as Rodeo, and its surrounding communities, have all been identified by the Office of Environmental Health and Hazards Assessment (OEHHA) as bearing a concentrated burden of health hazards resulting from various pollution sources, including the Santa Maria and Rodeo Refinery facilities.[296] This means that impacts, which may appear insignificant by themselves, are indeed significant when considered in the context of and in combination with existing sources of environmental impacts, which often tend to be more concentrated in some areas, such as those where these two facilities are located.

With regard to the Santa Maria facility, Santa Maria, Nipomo and Guadalupe score high on the OEHHA's indicators used to highlight environmental justice, or highly burdened

[296] OEHHA Cal Enviro Screen 1.1 (amended), Statewide Zip code Results, Nipomo, Guadalupe, Santa Maria, available at: http://oehha.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=1d202d7d9dc84120ba5aac97f8b39c56, and Zip code Results, Rodeo, available at: http://oehha.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=1d202d7d9dc84120ba5aac97f8b39c56,

communities.[297] Some of these indicators or factors include: number of pollution sources, including active and inactive waste cleanup sites; heavy industrial facilities, such as refineries; and hazardous waste, groundwater waste, presence of ozone and ozone precursors in the ambient environment, among others. The public health indicators examined further include, *inter alia*, asthma and low birth weight rates.

Nipomo has a high concentration of solid waste sites, including both active and in-active clean-up sites.[298] This means that the residents of the Nipomo already bear the burden of existing concentrated mal-odors, methane and carbon dioxide emissions from those facilities alone.[299] Nipomo also scores within the top 3% of the state's highest Toxic Release Inventory chemical burdens and within the top 1% of the state's burden from pollution caused by pesticide use.[300] Guadalupe is identified as a linguistically isolated city, and similar to Nipomo has a high concentration of hazardous waste facilities.[301] It also bears the impacts of a high concentration of emissions from other concentrated pollution stationary sources, such as the Santa Maria Refinery.[302] The combined impacts of these factors renders that city and the surrounding area, a particularly vulnerable community that suffers a high health burden from existing contaminating sources. [303]

Much like Nipomo and Guadalupe, Rodeo also ranks in the top 8% of the state's highest concentration of hazardous waste facilities, has a high concentration of contamination from Toxic Release Inventory chemicals, ranking in the top 3% for that factor.[304] Moreover, Rodeo also suffers from a high rate of low birth weights and asthma, ranking in the top 1 and 16% for each, respectively.[305]

The particular vulnerabilities of these communities, and the existing pollution burdens that exist in each, even without the added impacts of refining tar sands at the SFR, in combination with its related components in both the Throughput Increase and Propane Fuel Recovery Projects, demand a full analysis of the additional burden that will result from this Project. Only then can any decision making body properly ascertain the degree of significance of the cumulate impact of this Project, and the cumulative local impact is especially important. This analysis is an integral component of CEQA, one that the RDEIR illegally omitted.[306]

VI. THE RDEIR FAILS TO ANALYZE A REASONABLE RANGE OF PROJECT

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[297] *See*, OEHHA Cal Enviro Screen 1.1, Statewide Zip code Results, Nipomo, Guadalupe, Santa Maria, *supra*, at: http://oehha.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=1d202d7d9dc84120ba5aac97f8b39c56.
[298] OEHHA Cal Enviro Screen 1.1 (amended), Statewide Zip code Results, available at: http://oehha.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=1d202d7d9dc84120ba5aac97f8b39c56.
[299] OEHHA, California *Communities Environmental Health Screening Tool, Version 1.1 Guidance and Screening Tool*, September 2013 Update, Matthew Rodriguez, Cal EPA, and George V. Alexeeff, Ph.D., Director of OEHHA, available at: http://oehha.ca.gov/ej/pdf/CalEnviroscreenVer11report.pdf.
[300] *See* OEHHA Cal Enviro Screen 1.1, *supra*, and *see, Id*.
[301] *Id*.
[302] *Id*.
[303] *Id*.
[304] OEHHA, Cal Enviro Screen 1.1 (amended), Statewide Zip code Results, Rodeo, at: http://oehha.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=1d202d7d9dc84120ba5aac97f8b39c56.
[305] *Id*.
[306] CEQA Guidelines §§ 15064(d), 15125(c); *see also, Kings County Farm Bureau*, 221 Cal. App. 3d 692, 729.

ALTERNATIVES.

An EIR is not considered complete unless it has considered a "reasonable range of potentially feasible alternatives" to a proposed project.[307] The feasibility of an alternative is determined if it is "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors."[308] An EIR's alternatives analysis is considered satisfactory as long as it contains "sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project."[309] "The degree of specificity required in an EIR 'will correspond to the degree of specificity involved in the underlying activity which is described in the EIR.'"[310] Therefore, an EIR must contain more details for a specific project than an EIR for an approval of a general plan.[311]

The RDEIR fails to evaluate a reasonable range of alternatives and consider the alternatives in sufficient detail to allow a meaningful analysis and evaluation.[312] The RDEIR analyzed only two alternatives—a no project alternative, a loop rail unloading configuration alternative, and a reduced rail delivery alternative.[313] The RDEIR also identified three other alternatives that were considered, but rejected because they were either not technically feasible, failed to attain the basic objectives of the project, or would result in greater impacts than the proposed project. These rejected alternatives include two crude transportation alternatives (trucking and marine transport) and an alternative rail unloading sites alternative.[314]

CEQA does not have an established legal standard for the scope of the alternatives considered, but courts have held the scope of the alternative "must be evaluated on its facts," on a case-by-case basis.[315] The rule of reason judges the scope of the alternatives.[316]

Parties objecting to the EIR are not responsible for formulating alternatives for consideration—the lead agency bears this burden.[317] Objecting parties will rarely have access to the same information that the lead agency does, and thus will be limited in their ability to suggest sufficiently detailed and specific alternatives.[318] The lead agency is in a better position to make these suggestions since they probably have greater access to information than the objecting parties.[319] However, the following discussion illustrates the inadequacy of the alternatives analysis contained in the RDEIR.

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[307] CEQA Guidelines § 15126.6(a).
[308] Cal. Pub. Res. Code § 21061.1.
[309] CEQA Guidelines § 15126.6(d).
[310] *Al Larson Boat Shop, Inc. v. Bd. of Harbor Commrs.* (2d Dist. 1993) 18 Cal.App.4th 729, 746 (quoting CEQA Guidelines § 15146).
[311] *See id.*
[312] *See* CEQA Guidelines § 15126.6(d).
[313] See RDEIR Table 5.10, p. 5-53.
[314] *See* RDEIR at 5-2.
[315] *Citizens of Goleta Valley v. Bd. of Supervisors* (1990) 52 Cal.3d 553, 566.
[316] CEQA Guidelines § 15126.6(a).
[317] *See Laurel Heights I*, 47 Cal.3d at 406.
[318] *Id.*
[319] *See id.*

The RDEIR fails to consider an alternative that would avoid putting people in unnecessary danger during the transport of the volatile crude. The Project as proposed involves locomotives travelling through highly densely populated areas of central California, including Sacramento. This route exposes a large population to air emissions associated with locomotive operation, and greatly increases the human health and safety risks of potential accidents or spills. Along the route is the Sacramento-San Joaquin Delta. The delta is home to a number of native Californian species, used for major agricultural purposes in the state, and is a major water source for much of the state. A spill or train derailment in this area, of any magnitude, risks the health and safety of not only those in the surrounding area, but all over the state as well.

Alternative modes of transporting crude oil from across North America should also be analyzed more thoroughly. Though two options were preliminarily considered, these alternatives were not fully analyzed in the RDEIR. Finally, given the dwindling local supply of crude oil feedstock for the Santa Maria facility and the potentially massive overhaul to a different quality feedstock on account of this and other connected Phillips 66 projects, the point must be made that the existing facility will soon outlive its purpose. Thus, Phillips' proposal presents a choice: should it be allowed to extend this refining operation for several decades by re-purposing the Santa Maria facility to process tar sands oil that is imported by rail? The RDEIR should have evaluated, instead of obscuring, this choice and its environmental implications. The RDEIR failed to include this and other reasonable alternatives in its analysis, and the document should be revised and recirculated to correct these deficiencies.

VII. CONCLUSION

For the reasons stated above, the RDEIR remains inadequate under CEQA. The County must substantially revise and recirculate the document in order to correct its numerous defects.

It is important to note that the RDEIR does not provide a sufficient basis for the County to make a statement of overriding considerations. In order to approve an EIR with significant and unavoidable impacts, the lead agency must also make a statement of overriding considerations explaining why the benefits of the project would outweigh the significant environment impacts.[320] This statement must be supported by substantial evidence in the record.[321] This RDEIR identifies a number of impacts that it has found to be significant and unavoidable, including significant deterioration of air quality in San Luis Obispo County and along the UPRR mainline, increased risk of catastrophic train derailments and explosions, and degradation of sensitive biological resources. In order to approve the RDEIR with these significant impacts unmitigated, the County must make a finding that the benefits of the project outweigh those impacts.[322]

There is no basis for a finding that the benefits of the Project would outweigh its significant costs to the environment and to the health and safety of the thousands of people living in San Luis Obispo County and along the UPRR main line. The RDEIR offers an obscured project objective in an apparent attempt to suggest that the County develop a statement of

[320] CEQA Guidelines §§ 15092, 15093.
[321] *Id.* § 15093(b).
[322] *Id.*

overriding considerations, include allowing the refinery to obtain a range of competitively priced crude oils, and "[m]aximiz[ing] the use of existing infrastructure and resources to support the economic vitality of the County and State."[323] However, the RDEIR later notes that "[g]iven the limited increase in local expenditures associated with the Rail Spur Project, the economic growth associated with future development at the proposed project site would not be significant," and "minimal new operational employment would be associated with the Rail Spur Project."[324]

Finally, the County is not presented with a complete picture of this Project. The RDEIR restricts the Project in scope, diminishing its impacts, and making any weighing or calculation of the costs and benefits of the Project impossible. Any determination to the contrary is not supported by substantial evidence, violates CEQA, and would display a total disregard for public and worker health and safety. For these, and the reasons listed above and detailed in the accompanying attachments, the County must reject this RDEIR, revise its flawed analyses and recirculate it for public comment under the procedures for a programmatic level EIR.

Sincerely,

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Yana Garcia
Heather Lewis
on behalf of Communities for a Better Environment

Devorah Ancel
on behalf of Sierra Club

Shaye Wolf
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Ethan Buckner
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Comment supported by:

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The City of Berkeley
West Oakland Environmental Indicators Project
Crockett Rodeo United to Defend the Environment (C.R.U.D.E.)
West Oakland Environmental Indicators Project
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South Asian Americans for Climate Justice
The SunFlower Alliance
Wellstone Democratic Club
Citizens Against Hazardous Oil Trains (Fremont)
Idle No More SF Bay Area
350 Bay Area
350 Silicon Valley
GreenAction for Health and Environmental Justice
San Francisco Baykeeper
Pittsburg Defense Council

[323] RDEIR at 2-1 to -3.
[324] RDEIR at 6-2.

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BEFORE THE GOVERNING BOARD OF THE

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

In the Matter of **The South Coast Air Quality Management District's December 12, 2014 Approval and Certification of the Final Negative Declaration for the Phillips 66 Carson Crude Oil Storage Capacity Project**	**PROJECT PROPONENT PHILLIPS 66 COMPANY's OPPOSITION TO APPEAL OF APPROVAL AND CERTIFICATION OF THE FINAL NEGATIVE DECLARATION FOR THE PHILLIPS 66 CARSON CRUDE OIL STORAGE CAPACITY PROJECT FILED BY COMMUNITIES FOR A BETTER ENVIRONMENT**

Project proponent Phillips 66 Company (Phillips 66) opposes Communities for a Better Environment's (CBE) Appeal to the South Coast Air Quality Management District (District) Governing Board of Approval and Certification of the Final Negative Declaration for the Phillips 66 Los Angeles Refinery Carson Plant Crude Oil Storage Capacity Project (Project). The Executive Officer, the final decisionmaking authority for permit issuance, properly reviewed and adopted the Negative Declaration and approved the project in full compliance with the California Environmental Quality Act (CEQA). The appeal is not proper and there is no legal basis for the request.

I.
INTRODUCTION

On November 21, 2012, Phillips 66 filed an application with the District to construct a new crude storage tank at its Los Angeles Refinery (Refinery) Carson Plant to enable the Refinery to offload a ship with a capacity larger than 400,000 barrels (e.g., Aframax at 720,00-barrel capacity and Suezmax at 1,000,000-barrel capacity) (referred to in this document as a "large tanker") in one visit to Berth 121 in the Port of Long Beach (marine terminal).[1,2] The large tankers are typically used for longer ocean voyages, and the Refinery receives crude in these tankers from South America, the Middle East and Alaska. Currently, because the Refinery's Carson Plant does not have a tank large enough to hold a fully-loaded large tanker, fully-loaded large tankers must visit Berth 121 twice to unload their contents. Part of the crude cargo is offloaded during the first visit but the large tanker must then go out to anchor in the harbor and wait until a sufficient amount of crude has been used in the Refinery so that there is enough space in the Carson Plant crude storage tanks to finish offloading the remaining crude on the large tanker. This process can take several days. As a result, Phillips 66 incurs demurrage costs that must be paid while the large tanker is at anchor, during which the large tanker continues to emit NOx, SOx, particulate matter and other pollutants into the Southern California air basin as it waits to offload the remaining cargo. Last year alone the Refinery paid nearly $4 million in demurrage costs.

The Project would allow the large tankers to unload crude in one visit, thus cutting demurrage costs and reducing port emissions. The large tankers were designed to reduce transportation costs of crude by taking advantage of "economies of scale"; the more crude that can be transported at once on a longer voyage, the lower the cost per barrel of transporting the crude.

The District circulated a draft Negative Declaration for the Project on September 10, 2013 for a 30-day review period. The draft Negative Declaration concluded that the proposed Project would not result in any significant impacts to the environment.

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[1] Phillips 66 receives crude oil transported via marine waters and for utilization at the Refinery's Carson Plant at Berth 121 in the Port of Long Beach.

[2] Phillips 66 submitted a revised application on March 11, 2013.

CBE filed comments on October 9, 2013. These comments asserted that the Negative Declaration failed to fully and accurately describe the whole of the project and therefore did not properly evaluate potential impacts of the project. CBE provided corporate quarterly and annual investor statements and other financial documentation that, in general, describe a corporate strategy to process increasing amounts of what the company calls "advantaged crudes" at its eleven United States refineries. When Phillips 66 corporate documents utilize the term "advantaged crudes," they mean crude oil that costs less than the cost of the benchmark Brent crude. In order to use these documents to support its arguments, however, CBE had to create an entirely new and incorrect definition for the term "advantaged crudes" – CBE's comments asserted that advantaged crude means Bakken and Canadian tar sands crudes. Applying its own definition to Phillips 66's corporate statements, CBE asserted that Phillips 66 intended to use the Project intended to increase the amount of these crudes refined at the Los Angeles Refinery. CBE also alleged that the use of Bakken and Canadian tar sands crudes would cause more emissions of criteria and toxic air pollutants.

The District reviewed the comments by CBE and fully responded to each comment.[3] The District's Executive Officer is the decision-making authority for permits issued by the District and, thus, the accompanying CEQA document, in accordance with the California Health and Safety Code, CEQA and District rules and regulations. The Executive Officer determined that the none of the information provided by CBE constituted substantial evidence "that the proposed project may have one or more significant effects."[4] In particular the Executive Officer found that, while the Project reduced costs of transporting some crudes, it was not particular to any specific type of crude, that the Refinery must run a blend of crudes in order to meet the particular specifications and equipment limitations of the Refinery, that the Refinery was already processing heavy Canadian crudes including tar sands within the blend of crude that it runs, that in order to run Bakken crude or Canadian tar sands crudes in amounts that changed the blend Phillips 66 would

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[3] Contrary to CBE's contentions, this lengthy and detailed review was not "rubber-stamping."

[4] *See*, Response to Comment 3-1, page F-94 of the final Negative Declaration for the Phillips 66 Los Angeles Refinery Carson Plant Crude Oil Storage Capacity Project.

need to make modifications to Refinery processing units, and that no such modifications were contemplated. Therefore, the Executive Officer approved the Negative Declaration on December 12, 2014 and issued the permit.

On January 2, 2015, CBE wrote a letter to the Executive Officer requesting that the Executive Officer withdraw the Negative Declaration. The request did not contain any new evidence of a significant impact. The District declined to withdraw the Negative Declaration on January 9, 2015.

On January 9, 2015 CBE filed its petition to the Governing Board to review the Executive Officer's determination, "deny certification, withdraw and re-consider" the approval, and included additional information not previously submitted to the decisionmaking authority, the Executive Officer.

II.
REASONS FOR DENIAL OF THE APPEAL

A. The Request for Appeal by CBE is Improper and Should be Denied.

In accordance with Section 42300 of the California Health and Safety Code, and District Rules 201 and 203, the Executive Officer is the final decisionmaking authority for the issuance of permits. CEQA requires that the decisionmaking authority for the project, in this case the permit, must be the same authority who reviews and approves the Negative Declaration. CEQA Guidelines Section 15074(b). Therefore, a request to have the Governing Board review the CEQA determination on a permit that has been approved by the Executive Officer is improper and would not comply with the requirements of CEQA.

1. CEQA Requires that the Decisionmaking Authority for the Project Also Make the CEQA Determination for the Project.

The CEQA Guidelines specify that the "decisionmaking body" of a public agency must review and consider a final EIR or approve a negative declaration prior to approving a project. CEQA Guidelines Section 15025(b). CEQA Guidelines Section 15356 defines the "decisionmaking body" as "any person or group of people within a public agency permitted by law to approve or disapprove the project at issue," and Section 15378(a)(3) defines the project as "an activity involving the issuance to a

person of a lease, permit, license, certificate, or other entitlement for use by one or more public agencies." In this instance, the Project is the construction by Phillips 66 of the tank that requires the issuance of a permit by the District.

2. The Executive Officer is the Final Decisionmaking Authority for the Issuance of a Permit to Operate.

The Executive Officer is the person "permitted by law" to approve or disapprove the air permit application for the Project, and is therefore the "decisionmaking body" who must make CEQA determinations associated with air permit applications.

California Health and Safety Code §42300(a) states:

> "Every district board may establish by regulation, a permit system that requires, except as otherwise provided in Section 42310, that before any person builds, erects, alters, replaces, operates, or uses any article, machine, equipment, or other contrivance which may cause the issuance of air contaminants, the person obtain a permit to do so from the air pollution control officer of the district."

Pursuant with this authority, in 1976 the District Governing Board adopted a series of rules in Regulation II providing for the issuance of permits by the Executive Officer. District Rule 201 currently states, in pertinent part:

> "A person shall not build, erect, install, alter or replace any equipment or agricultural permit unit, the use of which may cause the issuance of air contaminants or the use of which may eliminate, reduce or control the issuance of air contaminants without first obtaining written authorization for such construction from the Executive Officer."

And Rule 203(a) currently provides:

> "A person shall not operate or use any equipment or agricultural permit unit, the use of which may cause the issuance of air contaminants, or the use of which may reduce or control the issuance of air contaminants, without first obtaining a written permit to operate from the Executive Officer or except as provided in Rule 202."

Therefore, in accordance with the Health and Safety Code and District Rules, the Executive Officer is the final authority for the issuance of permits, and thus the decisionmaking

authority for permitting project approvals.[5] This determination was previously upheld in Los Angeles Superior Court in 1994, when the court found that the Executive Officer was the proper decisionmaking authority for a permit approval and thus for the CEQA determination.[6]

3. There Is No Avenue of Appeal to the District Governing Board through CEQA Guidelines Section 15074(f).

CBE's appeal petition asserts that the District's Governing Board is the highest-elected decisionmaking authority for the agency and therefore the Board must hear an appeal of the Executive Officer's CEQA determination. However, CEQA Guidelines Section 15074(f), relied upon by CBE, does not apply to the Governing Board.

Section 15074(f) provides:

> "When a non-elected official or decisionmaking body of a local lead agency adopts a negative declaration or mitigated negative declaration, that adoption may be appealed to the agency's elected decisionmaking body, if one exists. For example, adoption of a negative declaration for a project by a city's planning commission may be appealed to the city council. "

This provision does not create an avenue to appeal to the Governing Board. As demonstrated above, the Governing Board is not the decisionmaking body of the District with respect to permit decisions. In addition, the Governing Board is not an elected body. The composition of the District Governing Board is described in Health and Safety Code Section 40420. This section directs that the District "shall be governed by a district board consisting of 13 members ***appointed as follows…"*** The following eight paragraphs itemize the entities who have the power to appoint Governing Board members. In some but not all cases, the appointees must be elected officials in a different capacity (e.g., elected to a city council or county board of supervisors), but all members of the Governing Board obtained that position through appointment, not election.

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[5] Note that the District's Regulation XII allows any person to petition the Governing Board to hold a hearing on a permit application. The decision to hold such a hearing on an application is entirely discretionary on the part of the Governing Board; there is no right on the part of a petitioner to have such a hearing. However, in this case the permit has already been granted and there is no open application. Thus, the time to petition the Governing Board to hold such a hearing has passed.

[6] See, *Atwood v. South Coast Air Quality Management District* (1994), Case No. BC093076: The "decision-making body" is the person permitted by law to approve or disapprove the project. CEQA Guidelines Section 15356. By District Rule, this person is Dr. Lentz[sic], the Executive Officer. As such, it would appear that Dr. Lentz[sic] would be the person to review and consider the final EIR. (Tentative Ruling, Section III entitled "Consideration and Certification of the EIR"). Attached hereto as Exhibit 4.

B. The Executive Officer Properly Determined That a Negative Declaration Should be Prepared for the Project.

CBE alleges that the Executive Officer violated CEQA by failing to prepare an Environmental Impact Report (EIR) for the Project. However, based on all of the evidence presented in the whole of the record a Negative Declaration was the proper CEQA documentation to be prepared.

CEQA requires that if a lead agency determines that a proposed project would not have a significant effect on the environment than the agency shall adopt a negative declaration.[7] The District conducted a thorough and conservative analysis of the potential impacts of the project and found that there would not be any significant impacts. Furthermore, notwithstanding the reduction in waiting time during which ships are anchored and emitting just offshore, the District did not consider any reduction in ship emissions that would result from the Project, adding yet another conservative factor.

While CBE provided many pages of comments and opined that the project may have a significant impact on the environment, the District properly concluded that none of CBE's information amounted to substantial evidence of a significant impact. Preparation of an EIR is required whenever substantial evidence in the record supports a fair argument that significant impacts may occur. There is no such substantial evidence here.

CEQA defines "substantial evidence" as "fact, a reasonable assumption predicated upon fact, or expert opinion supported by fact. Substantial evidence is not argument, speculation, unsubstantiated opinion or narrative, evidence that is clearly inaccurate or erroneous, or evidence of social or economic impacts that do not contribute to, or are not caused by, physical impacts on the environment."[8] As explained in the Responses to Comments in the Final Negative Declaration, much of the information provided by CBE is not relevant to the Project It consists of general statements regarding refining operations that are not applicable to the Project, is predicated upon

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[7] California Public Resources Code §21080(c).

[8] California Public Resources Code §21080(e).

incorrect assumptions, or constitutes unsupported opinion. Hence, these comments did not provide substantial evidence of a significant impact, and the Executive Officer correctly approved the Negative Declaration.

C. CBE has not Provided Any Basis for Reconsideration of the Negative Declaration Approval Either by the Executive Officer or the Governing Board

In addition to alleging that the Executive Officer was not the final decisionmaking authority for the District, addressed above, CBE further alleges that Negative Declaration for the Project should immediately be withdrawn because the information provided by the Executive Officer in the Responses to Comments in the Final Negative Declaration was new and in itself required additional public review. Also, CBE provides additional information, not previously submitted to the District, to support its contention that the Project description was inadequate and that the Project will have a significant impact on the environment. Contrary to CBE's contentions, neither the information provided by the Executive Officer in the Responses to Comments nor the additional information submitted by CBE to the Governing Board provide substantial evidence of a new avoidable significant impact.

1. The information provided in the Responses to Comments did not Require Recirculation Before Adoption.

CEQA Guidelines Section 15073.5 requires a lead agency to recirculate a negative declaration, "when the document must be substantially revised after public notice of its availability has been previously been given pursuant to Section 15072, but prior to its adoption." Under this section, "substantial revision" means "a new, avoidable significant effect is identified and mitigation measures or project revisions must be added in order to reduce the effect to insignificance." This section also states that, "recirculation is not required when new information is added to the negative declaration which merely clarifies, amplifies, or makes insignificant modification to the negative declaration."

The Executive Officer provided information in the Responses to Comments that clarified the scope of the Project, explained why certain information provided by CBE was not relevant to the Project or was inaccurate, and corrected many of the misunderstandings CBE appear to have

regarding Project impacts. None of the new information identified a "new, avoidable significant impact" and therefore it did not constitute a substantial revision requiring recirculation. Hence, the approval of the Negative Declaration was proper.

2. CBE's Appeal to the Governing Board Does not provide substantial evidence of any significant impacts.

Attached to the Petition for Appeal, CBE included several documents in an attempt to bolster its argument that the approved Negative Declaration did not accurately and completely describe the Project or analyze the impacts of the Project, in particular, alleged changes in crude quality. However, the information attached to the appeal is not new, is not relevant to this project, and more importantly, does not provide substantial evidence of a new significant impact from the Project that would require reconsideration of the Negative Declaration approval.

Under CEQA, only three conditions require additional review after a Negative Declaration has been approved[9]: (1) where substantial changes are proposed to the Project that will require major revisions to the document to address a new significant impact or a substantial increase in an already significant impact; (2) where substantial changes to the circumstances of the project will require major revisions to address a new significant impact or a substantial increase in an already significant impact: or (3) where new information of substantial importance, which could not have been known with reasonable diligence at the time of adoption, demonstrates the project will have new significant effects not discussed, or more severe than previously determined.[10] None of these circumstances exist here. There have been no changes to the Project. The information provided by CBE does not demonstrate a change in the project, its circumstances or impact, and there is no "new information of substantial importance" that CBE has provided demonstrating new impacts. In fact, the "new" evidence is merely a rehashing of its previous comments.

As in the comments submitted during the public review period for the Negative Declaration, CBE again alleges that corporate statements support the conclusion that the project scope is inadequate. As "evidence" of this conclusion, CBE references a Phillips 66 investor

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[9] This occurs only where an additional discretionary action is pending. However, in this case, there is none.

[10] CEQA Guidelines§ 15162(a)

statement entitled "2014 Fact Book,"[11] that contains, among much additional information, a statement that: "[w]e are adding additional tankage at our Los Angeles Refinery to increase access to advantaged waterborne crudes." CBE also includes a statement from the transcript of an investor conference call from the third quarter of 2014[12], where the Phillips 66 Chairman and CEO is quoted as stating that the company will "get to 100% advantaged crude in the next year." Finally, CBE references a map in a Phillips 66 slide presentation entitled *Investing, Building, Growing – Phillips 66 Investor Update, Third Quarter 2014,* ("Investor Update Presentation")[13]. These three sentences, each taken out of context, are stitched together to purportedly support the conclusion that Phillips 66 intends to increase the use of Bakken and Canadian tar sands crude oil as feed to the Refinery, and this, in turn, will have a significant impact on the environment.

These three sentences do not constitute "new" evidence for several reasons. CBE made exactly the same argument and proffered nearly identical "evidence" in its comments on the Negative Declaration during the public comment period. *See*, for example, Comments 2-3 and 2-15 in the final Negative Declaration.[14] As part of those earlier comments, CBE included nearly identical statements taken from Phillips 66 investor documents telling investors that the company plans to increase the use of "advantaged crudes" in the coming years. CBE incorrectly concludes, both in the Negative Declaration comment period and now, that the company's statements regarding "advantaged crudes" means that the Los Angeles Refinery will increase the use of two particular types of crude, Bakken and Canadian tar sands crude.

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[11] Exhibit L to CBE's petition for Appeal

[12] Exhibit I was withdrawn from the Exhibits submitted by CBE with the Appeal

[13] Exhibit J to CBE's petition for Appeal

[14] Comment 2-3 states: "Additionally, Phillips 66's Project description is incomplete, filing to identify that the proposed changes to the refinery inputs to the crude unit, including expanded use of the brine stripper and the added heat exchangers, which are exactly the increased desalting and temperature controls needed to enable processing of cheaper "Advantaged Crude" which Phillips 66 has publically announced it is bringing by rail and ship to California, including to the Los Angeles refinery."
And see Comment 2-15:"Phillips 66 showed in its Annual Report business plans emphasizing new use of 'Advantaged Crudes', in other words, cheaper unconventional crude oils including Canadian tar sands crude, and Bakken Crude (from the Dakotas) and to bring them to West Coast refineries, including the Los Angeles refinery by rail, as well as by marine vessel, as explained by the accompanying legal comments, and as shown in the report's map and statements below." (Reference to Phillips 66, 2012 Summary Annual Report.)

While some Phillips 66 United States refineries may increase the use of these crudes in the future, the Project does not cause or facilitate doing so at the Los Angeles Refinery. "Advantaged crude," as used by Phillips 66, generally means economically advantaged and does not refer to a particular type of crude. *See*, Declaration of Darin Fields attached hereto as Exhibit 1 at 7: "[a]s this term is used by Phillips 66, this term simply means that the cost of the crude is less than the cost of the benchmark Brent crude." Additionally, the Los Angeles Refinery is already operating at essentially 100% advantaged crudes. Declaration of Darin Fields at 17. Therefore, the Project will not increase the use of advantaged crude at the Los Angeles Refinery.

In addition, as in its comments on the Negative Declaration, CBE misinterprets Phillips 66 statements regarding advantaged crude. Advantaged crudes are selected from among the crudes that are otherwise appropriate for and available to a particular refinery. Phillips 66 considers a number of factors in selecting crude oil for the Refinery. The factors include whether a particular crude is compatible with the design of the refinery, either alone or when blended with other crudes, and whether it can be refined to yield the product slate desired for that refinery's market, while adhering to Phillips 66's mission of operating safely, reliably, and in compliance with environmental laws. Declaration of Darin Fields at 8. As explained in the Responses to Comments in the final Negative Declaration, heavy Canadian crudes, including tar sands crudes, are currently being blended and run at the Refinery. In fact, they have been run at the Los Angeles Refinery for nearly 15 years.

CBE references a graphic in the Phillips 66 "Investor Update Presentation" broadly depicting transportation routes in the United States. Without the narrative that accompanied the presentation, this slide cannot be interpreted accurately. It is an over-simplified depiction of possible options for moving crude by rail to the various Phillips 66 refineries. It was not meant to depict actual or planned movement of Bakken crude to the Los Angeles Refinery by marine vessel. *See*, Declaration of Ryan Caillier, attached hereto as Exhibit 2.

Additionally, Bakken crude, while currently advantaged for other refineries in the Phillips 66 refinery network, is not advantaged for the Los Angeles Refinery when delivered by marine vessel. See, Declaration of Maureen McCabe, attached hereto as Exhibit 3, at 12. And significant

technical difficulties and restrictions associated with transporting Bakken by marine vessel, make it infeasible to deliver it the Los Angeles Refinery via marine vessel. Declaration of Maureen McCabe at 10-11. Thus, the processing of Bakken is not a foreseeable consequence of the installation of this Project. Declaration of Maureen McCabe at 14.

Further, the Project will not have an effect on the delivery of Canadian heavy crudes to the Los Angeles Refinery. Currently, the Refinery receives the heavy Canadian crudes in partially loaded Aframax tankers. The tankers are partially loaded due to water depth and other constraints at the facility where the crude is loaded. The tankers that deliver the heavy Canadian crudes can be offloaded in one vessel call. Therefore, the addition to the Refinery of a larger tank will not impact the delivery of the heavy Canadian crudes, including tar sands crudes.

The final Negative Declaration repeatedly, consistently and correctly states that the Project is not about bringing Bakken crude oil and Canadian heavy crude oil to the Los Angeles Refinery. In the Appeal Petition, CBE tries again to drown the District in extraneous information to create the impression that it is. If there was any remaining ambiguity on this point, it is dispelled by the Fields, Caillier and McCabe declarations, which further corroborate the facts upon which the Executive Officer approved the Negative Declaration and issued the permits.

CBE's Appeal Petition conveys additional exhibits that are not relevant to the Project. For instance, reports and comments on other projects around the state do not provide relevant information regarding the Project at hand. Reports on the accidents at other facilities, on rail safety and general overviews of general impacts of refining, and comments on other Refinery projects do not provide facts specific to the Project that could be considered evidence of significant impacts as a result of the Project.

Finally, even if the information submitted with CBE's petition was "new," the majority of the information could easily have been submitted to the District before the Negative Declaration was approved. Nearly all was available months before the document was approved. However, CBE made no attempt to submit the information into the record. Note that in its January 2, 2015 letter to District staff requesting the Executive Officer withdraw the Negative Declaration (attached to the CBE petition as Exhibit R) CBE states that it contacted staff periodically to

request updates on the review and approval of the document on several occasions in 2014 after the close of comment period, including on February 4, March 20, July18, August 8, September 11, October 7 and November 5.

Therefore, CBE knew that it had ample opportunity to submit the information to the District for consideration prior to approval of the Negative Declaration.

III.
CONCLUSION

Because the Executive Officer, as the final decisionmaking authority for the issuance of permits, properly reviewed and considered all of the evidence in the whole of the record, determined that there was no substantial evidence of a significant effect on the environment and approved the Negative Declaration in accordance with CEQA, and review of the decision would in this instance be improper, the appeal by CBE should be denied.

Dated: January 29, 2015

Respectfully submitted,

By: 

Frances L. Keeler
Jocelyn D. Thompson
Attorneys for Project Proponent and Respondent
Phillips 66 Los Angeles Refinery

EXHIBIT 1

DECLARATION OF DARIN L. FIELDS

I, Darin L. Fields, declare:

1. I am the Refinery Manager for the Phillips 66 Company ("Phillips 66") Los Angeles Refinery. I make this declaration in support of Phillips 66's opposition to the *Appeal of Approval and Certification of the Final Negative Declaration for the Phillips 66 Carson Crude Oil Storage Capacity Project* filed by Communities for a Better Environment ("CBE Appeal"). I have personal knowledge of the facts set forth in this declaration and if called as a witness, I could and would testify competently to them.

2. I have been the Refinery Manager for the Phillips 66 Los Angeles Refinery since February 1, 2014. Prior to becoming Refinery Manager of the Los Angeles Refinery, I was the Operations Manager of the Phillips 66 Sweeny Refinery in Old Ocean, Texas.

3. Altogether, I have been employed by Phillips 66 and its predecessors (including ConocoPhillips Company and Phillips Petroleum Company) for 26 years. Fifteen of these years, I have held management positions.

4. The Los Angeles Refinery includes the Wilmington Plant, the Carson Plant, and a marine products terminal at Berths 148-151 in the Port of Los Angeles.

5. As Refinery Manager of the Los Angeles Refinery, my responsibilities include the profit/loss performance of the Los Angeles Refinery, along with all aspects of refinery operations. I am familiar with the equipment and operations of the Los Angeles Refinery, including the crude oil and other raw materials and intermediate products procured for the refinery, and the products and co-products produced by the refinery. Crude oil selection has a substantial influence on the performance of the refinery.

6. As a member of the Refinery management team, I participate in management decisions relating to the Los Angeles Refinery. I am familiar with the business objectives established by the company. I am responsible for implementation of corporate objectives that are relevant to the operation of the Los Angeles Refinery.

7. Currently, one of the objectives set by corporate management is to use what the company refers to as "advantaged crude." As this term is used by Phillips 66, this term simply

means that the cost of the crude is less than the cost of the benchmark Brent crude. For example, in presenting the company's progress in shifting to advantaged crude in 2012, Phillips 66 management explained, "[w]e're trying to displace Brent price crudes out of our systems … and ultimately get to 90% of our total crude based on something other than Brent price." (Phillips 66 First Annual Analyst Meeting, December 13, 2012, edited transcript, p. 13, found at Final Negative Declaration, Appendix F, Exhibit R; see also Exhibit U.)

8. The objective of running advantaged crude oil is only one of many factors to be considered in selecting the crude oils for a particular refinery. The paramount considerations in selecting crude oils are whether they are compatible with the design of the refinery, either alone or when blended with other crudes, and whether they can be refined to yield the product slate desired for that refinery's market, while adhering to our mission of operating safely, reliably, and in compliance with environmental laws. For a particular refinery, advantaged crudes are selected from among the range of crudes compatible with the design and desired product slate for that refinery, and that can feasibly be delivered to that refinery.

9. Depending upon the circumstances, cost-advantaged crude oils for any particular refinery in the United States may include, among others, heavy crude oil from Canada and South America, light crude oil produced from shale formations such as the Bakken in North Dakota and the Eagle Ford in Texas (see 2012 Summary Annual Report, Final Negative Declaration, Appendix F, Exhibit D, p.8); crude from the Mississippian Lime formation in Kansas and Oklahoma (see 2012 Summary Annual Report, p. 24, found at Final Negative Declaration, Appendix F, Exhibit D); and Heavy Louisiana Sweet, Louisiana Light Sour, and Alaska North Slope (see Q4 2013 Phillips 66 Earnings Conference Call, January 29, 2014, edited transcript, p.4, excerpts from which are attached as Exhibit 1 to my declaration). Whether a particular crude is considered advantaged varies by refinery and can change from time to time.

10. As further described in the Declaration of Maureen McCabe, crude oil can also be presented at an advantaged price because of unexpected events. We call these "distressed crudes," and they are also considered advantaged crudes.

11. The cost comparison for determining whether a crude is advantaged is based

on the "landed" price at a particular location. As management has stated: "[W]e define advantaged as crudes that land at our refineries at a discount to landed Brent." (See Phillips 66 Analyst Meeting, April 10, 2014, edited transcript, p. 12, excerpts from which are attached as Exhibit 2 to my declaration.) The landed price includes the per barrel purchase price of the crude oil as well as transportation costs and other costs.

12. Transportation costs vary significantly depending upon the mode of transportation, e.g., truck, pipeline, train, marine vessel, barge or some combination of these. Within a given mode of transportation, the transportation cost may be affected by distance, by equipment availability, or potentially by constraints along the route. For example, it generally costs more per barrel to transport crude oil by rail from the Midwest to California than it does to transport the same crude oil to the East Coast.

13. Phillips 66 operates 11 refineries located in the United States. Because the cost comparison for determining an advantaged crude is based on the landed price for a refinery, there is wide variation among the refineries as to which crudes are considered advantaged.

14. For example, when I was the Operations Manager at the Sweeny Refinery, we considered crude oil from the Eagle Ford shale in Texas to be advantaged, among others. As described further in the Declaration of Maureen McCabe, Bakken crude oil may be considered an advantaged crude for some Phillips 66 refineries; however, Bakken crude oil delivered by marine vessel is not considered an advantaged crude for the Los Angeles Refinery due to substantial logistical obstacles.

15. Across the company, the Phillips 66 refineries operated at approximately 95% advantaged crude oil in the third quarter of 2014. (See Phillips 66 Investor Update, Third Quarter 2014, p. 24, found at CBE Appeal Petition, Exhibit J.)

16. The Crude Oil Storage Capacity Project at the Los Angeles Refinery will allow larger marine vessels (e.g., Suezmax) to unload their entire cargo in one ship call. This will improve the efficiency of our unloading process and avoid demurrage incurred while a ship waits for us to move enough crude oil out of our tanks to be able to receive the remainder of the vessel's cargo. In 2014 alone, the company incurred nearly $4 million in demurrage costs associated with the

need for larger vessels to unload in two ship calls, and the delay between the unloading events.

17. The Crude Oil Storage Capacity Project will not cause the Los Angeles Refinery to refine more advantaged crude because the refinery already runs nearly 100% advantaged crudes. However, by improving the efficiency of vessel unloading and avoiding demurrage, the Project will allow the Los Angeles Refinery's landed crude costs to compare even more favorably to benchmark Brent crude oil. For this reason, the Project can be said to increase the refinery's access to advantaged waterborne crudes.

18. In the appeal petition to the South Coast Air Quality Management District Governing Board, Communities for a Better Environment ("CBE") asserts that the Project will cause an increase in the amount of Canadian tar sands crude oil and Bakken crude oil refined at the Los Angeles Refinery. CBE's assertions rely on a misreading of corporate statements. CBE interprets the Phillips 66 term "advantaged crude" to mean Canadian tar sands crude and Bakken crude. As demonstrated in paragraphs 7 through 14, above, this is not correct.

19. Using the company's definition, Bakken crude may be considered advantaged at some Phillips 66 refineries in the United States, but Bakken crude delivered by marine vessel is not considered advantaged for the Los Angeles Refinery due to substantial logistical obstacles and the high cost of transportation, and the Project will not change this.

20. Canadian heavy crudes, including what CBE calls "tar sands" crude, are currently considered moderately advantaged at the Los Angeles Refinery, but they will not be affected by the Project because they are not transported to the refinery using the Suezmax and larger vessels that currently must unload in two ship calls, as described further in the Declaration of Maureen McCabe.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed this 29 day of January, 2015, in Los Angeles, California.

DARIN L. FIELDS

EXHIBIT 1

THOMSON REUTERS STREETEVENTS

EDITED TRANSCRIPT

PSX - Q4 2013 Phillips 66 Earnings Conference Call

EVENT DATE/TIME: JANUARY 29, 2014 / 05:00PM GMT

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PRESENTATION

Operator

Welcome to the fourth quarter 2013 Phillips 66 earnings conference call. My name is Shannon, and I will be your operator for today's call.

(Operator Instructions)

Please note that this conference is being recorded. I will now turn the call over to Mr. Clayton Reasor, Senior Vice President, Investor Relations, Strategy and Corporate Affairs. Mr. Reasor, you may begin.

Clayton Reasor - ***Phillips 66 - SVP-IR, Strategy and Corp Affairs***

Thank you. Good morning. Welcome to Phillips 66 fourth quarter earnings conference call. With me this morning are Greg Garland, our Chairman and CEO; our CFO, Greg Maxwell and EVP, Tim Taylor. The presentation material we will be using can be found on the IR section of the Phillips 66 website, along with the supplemental, financial and operating information.

Slide 2 contains our Safe Harbor statement. It is a reminder that we will be making forward-looking comments during the presentation, and our Q&A session. Actual results may differ materially from today's comments, and factors that could cause these results to differ are included here on the second page of the presentation, as well as in our filings with the SEC.

So that said, I will turn the call over to Greg Garland for some opening remarks. Greg?

Greg Garland - ***Phillips 66 - Chairman and CEO***

Thanks, Clayton. Good morning, everyone. Thanks for being with us today.

We ended 2013 with a solid quarter. We operated well. It allowed us to capitalize on favorable crude differentials, while exporting record volumes of refined products. Our adjusted earnings for the quarter were $800 million, and our cash flow from operations excluding working capital was $1.3 billion.

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Slide 5 provides a comparison of our fourth quarter adjusted earnings with the third quarter, looking at it on a segment basis. Compared to last quarter, our earnings increase were largely driven by improved results in refining. Partially offsetting this, are lower earnings from marketing and specialties, as well as midstream. I will cover each of these segments in more detail later on.

The Midstream segment posted lower earnings this quarter, as higher earnings from NGL Operations were more than offset by lower earnings from DCP. The 2013 adjusted return on capital employed from midstream was 15%, and this is based on an average capital employed of $3.2 billion.

Slide 7 shows Midstream's fourth quarter earnings of $121 million, a decrease of $27 million from last quarter. Transportation made $50 million this quarter, which is pretty much in line with last quarter. However, compared to last year this business line is up significantly, as results now reflect market rates.

DCP Midstream's earnings decreased by $50 million, primarily due to lower equity gains resulting from DPM unit issuances to the public, and along with lower volumes mainly due to adverse weather impacts. NGL operations and other were up, primarily due to inventory and higher propane margins and sales. On the next slide, we will cover -- we will move onto a discussion of our chemical segment.

In Chemicals, olefins and polyolefins ran well, with a global capacity utilization of 95% for the quarter. In addition, the SA&S business successfully completed a planned major turnaround of its benzene unit located in Pascagoula, Mississippi. The 2013 return on capital employed from our Chemicals segment was 26%, and this is based on an average capital employed of $3.8 billion.

As shown on slide 9, fourth quarter earnings for chemicals were relatively flat, compared to last quarter coming in at $261 million. In olefins and polyolefins, earnings were up mainly due to higher volumes, and increased equity earnings from its Saudi Polymers Company joint venture. Lower earnings from specialties, aromatic's and styrenic's more than offset this improvement, as a result of lower production and the cost impacts associated with the planned benzene turnaround in the fourth quarter.

Moving on to Refining. Our realized margin was $10.75 per barrel, with a market capture rate of 112%. The global crude utilization rate was 92%, and our clean product yield was 84%.

During the quarter, 94% of the Company's US crude slate was advantaged, and this compares with 66% last quarter. The increase was largely driven by additional domestic crude's consistently trading at a discount to Brent. We will cover this in more detail on slide 13. The 2013 adjusted return on capital employed for refining was 13%, and the average capital employed for this segment was $14.3 billion.

Slide 11 provides more detail on Refining earnings improvements in the fourth quarter. The Refining segment had earnings of $450 million, and this is up from a loss of $2 million last quarter. This increase is mainly due to higher realized margins, in spite of market cracks dropping an average of 28% worldwide.

In the Gulf Coast, margins improved largely due to product differentials, as exports and blending activities helped us realize better clean product prices. We also benefited from the fact that the distillate crack increased nearly 30% in the fourth quarter. The increase in the central corridor was largely driven by the widening of Canadian differentials, as well as improvements due to butane blending into the gasoline pool.

Western Pacific's improvement is mainly due to improved clean product yields, product differentials, and also secondary product values. For the Atlantic Basin, this region was down due to the impact of lower market cracks, as well as Bayway having a major scheduled turnaround during the fourth quarter. Other refining was down this quarter due to scheduled maintenance on the Keystone pipeline. All available pipeline capacity was used to deliver crude to our refineries, however, a lack of surplus capacity prevented us from capturing additional gains.

Next let's look at our market capture on slide 12. Compared to the market, our realized margin improved mainly from feedstock opportunities, most notably in the central corridor. In addition, secondary products were less of a negative impact this quarter, reducing the margin by $5.54 a barrel, compared with $6.35 last quarter.

As captured in the other bar, we also benefited from clean product differentials. During the quarter, we realized better prices on average for clean products, compared with the benchmark prices. In addition, as RIN prices moderated, the benefit of resulting lower expenses is reflected in this bar.

Slide 13 shows the comparison of advantage crude runs at our US refineries by quarter, for 2013 on the left, and for the past three years, as shown on the graph on the right. During the quarter, 94% of the Company's US crude slate was considered advantaged, and this compares with 66% last quarter. The 28 percentage point increase reflects the inclusion of other light and medium crude's which have been trading consistently at a discount to Brent. Some examples include HLS, LLS, and ANS.

On an annual basis, our advantaged crude slate has increased from 62% in 2012, to 74% in 2013. And this is due to processing an additional 118,000 barrels per day of tight oil, additional domestic crude's that consistently trade at a discount to Brent, as well as higher volumes of heavy Canadian crudes. The decrease in other heavy crude category from 27% in 2012, to 24% in 2013 is attributable mainly to downtime at our Lake Charles and Sweeny refineries this year.

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Operator

Our next question comes from Doug Leggate from Bank of America Merrill Lynch.

Doug Leggate - *BofA Merrill Lynch - Analyst*

Thanks, good morning, or good afternoon, everybody. In your presentation, you obviously talked about the change in definition, I guess of how you see advantaged crudes. What was -- I just want to get a little more detail on that. Are you saying basically that you are -- you have changed the definition, which means you are no longer pursuing a more aggressive change in the slate? Or are you still expecting to have some substitution within that newly-defined 94%? And I have got a couple follow-ups, please?

Tim Taylor - *Phillips 66 - EVP*

Okay. Doug, the definition really -- it is not definitional. It is just the fact that these -- particularly the Gulf Coast crudes and ANS have consistently traded in the fourth quarter at a significant discount to Brent. And I think that is a part of our crude slate -- we have always said that we expected those crudes to discount, and when they did, they would turn to advantaged.

That said, we continue to work on logistic solutions, particularly to the East and the West Coast and to the Gulf Coast. And we are very active in finding ways to substitute one advantaged crude for another, particularly with options that we see in the Permian and Mid-Con for crudes that deliver more value to our refining operations. So it is a very active area for us, both in terms of light, medium and heavy crudes, and the logistics and the operating optimization that we go through.

Doug Leggate - *BofA Merrill Lynch - Analyst*

I guess what I am trying to understand is that, was it a proactive -- there wasn't a proactive change in the slate? It was really more to what the market gave you that pushed you up to 94%? Is that the right way of thinking about it?

Clayton Reasor - *Phillips 66 - SVP-IR, Strategy and Corp Affairs*

I think that, generally, that is probably right. I think that, we, in the past we had not included LLS or HLS, or ANS for that matter, in advantaged crudes because it was trading at Brent or better. And what we are saying is, given that we -- products are priced off of Brent, and we think that will continue, that if the crudes are pricing at -- consistently at a discount to Brent, then we should consider those considered -- or consider those advantaged. Now I don't think it says that we are any less aggressive about substituting higher discounted crudes. But your point is correct, in that the market is the primary reason why we are considering LLS or HLS or ANS advantaged at this point.

Doug Leggate - *BofA Merrill Lynch - Analyst*

Thanks Clayton. That is very clear. If I could just get two quick follow-ups, please? I don't hold a lot of hope in this one, but any chance you can give us a breakdown between Bayway and Europe, in terms of the split of earnings in the quarter, or the loss in the quarter?

Clayton Reasor - *Phillips 66 - SVP-IR, Strategy and Corp Affairs*

There -- you are right. There is no chance on that one. (Laughter).

Doug Leggate - *BofA Merrill Lynch - Analyst*

Okay. And the last one for me is really more of a kind of big picture issue. And I guess, Greg, you have been quite vocal about your support for crude exports, in contrast to some of your refining peers. I wonder if you can just give us a quick kind of summary as to why you are taking that view? And I will leave it there, thanks.

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EXHIBIT 2

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PSX - Phillips 66 Analyst Meeting

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Jeremy Tonet *JPMorgan - Analyst*

PRESENTATION

Clayton Reasor - ***Phillips 66 - SVP of IR, Strategy & Corporate Affairs***

Good afternoon, and welcome to the Phillips 66 2014 analyst meeting. And on behalf of the entire management team of Phillips 66, let me express our thanks to those of you here in the room and those listening on the webcast. We appreciate your interest in our Company and hope you find the next couple hours of interest. My name is Clayton Reasor; I have responsibility for investor relations at Phillips 66.

In 2012, a new Company was formed. A Company with leading midstream; a global chemicals and integrated refining, marketing and transportation business. A Company that was constructed in a way to allow it to capitalize on the remarkable growth in domestically produced oil, natural gas, and shale NGLs. And over the last two years, Phillips 66 has been able to translate this production growth into strong earnings and cash flows.

We operated well; we increased our financial flexibility; created a great place to work for our employees, while being a good neighbor in the communities we operate in. And our share price reflects this performance.

But we are not here today to talk about our past or tell you what a good job we have done. Rather, we want to talk about our future. We plan to use the next two hours to share our plans for creating sustainable shareholder value with new specifics on growth, returns, distributions, and capital allocation.

We will have three speakers today, with our Chairman and CEO leading off. Greg Garland will discuss how the realization of our vision and execution of our strategy will create differentiated returns for our shareholders. Next up will be Phillips 66 Executive Vice President Tim Taylor, and Tim will provide new information about our exciting midstream growth plans and what is driving capital efficiency in refining. Greg Maxwell, our CFO, will provide an update on financial plans, an important topic given the value of maintaining a strong balance sheet in a business as cyclical as ours. Immediately following our CEO, Greg Garland, we'll come back to the podium and lead a Q&A session.

As part of our presentation and in response to your questions, we will be making forward-looking statements. Actual results may differ materially from the comments we make today, and factors that could cause those results to differ can be found on page 3 of this presentation, as well as in our filings with the SEC.

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So this is what we told you in December of 2012 that we wanted to accomplish in 2013. We checked the boxes. We are delivering on both the financial and the operating results. We IPO'd our MLP, Phillips 66 Partners. Chevron Phillips Chemical Company is advancing the first world-scale petrochemical complex we built on the US Gulf Coast in more than a decade.

When you think about our returns in refining, we've improved those by putting advantaged crudes to the front of the refineries. We exited last year at about a 90% advantaged crude rate. This reflects not only a market shift in crudes versus Brent but also our ability to put advantaged crudes to the front of the refineries.

We told you were going to acquire 2,000 railcars. We have done that. They are in service. Tim is going to tell you later today, we are in the process of acquiring another 1,200 cars.

We signed significant third-party agreements to load and unload advantaged crude. We will be able to extend our capabilities in advantaged crude, and we will highlight some of those today. We returned over $6 billion of capital to shareholders since May of 2012. At the same time, we've reshaped and reinvested in our portfolio.

We've increased dividends from $0.80 annually to $1.56. And as I said, we took in about 10% of the shares of the Company.

We also said that in 2012 and 2013 we were going to repay $2 billion of debt. We have done that, so we strengthened our balance sheet capability and our flexibility.

So as we think about the strategic drivers for our strategy, the underlying businesses of our Company have been around for more than 100 years. As you know, external environment has undergone significant recent change. Growing natural gas, natural gas liquids, crude oil production is reshaping our industry. We've gone from a period of extended resource constraint to volume production -- one of abundance and growing production.

We think US refining has a structural price advantage and energy cost advantage. It's going to allow us as an industry to effectively meet domestic demand and also compete for growing share of export markets. We think that global demand that's spurred by growth in developing countries like China, India, Brazil will grow more than 1 million barrels a day annually.

We think that investors will continue to place a higher multiple on businesses that have stable cash flows and significant growth potential. So refining is a significant source of cash for us, but it was, it is, and always will be a very volatile business. So part of our rationale for shifting the portfolio to more midstream and chemicals is the expectation for more stable cash flow and higher valuations. We also believe that the uplift from natural gas to natural gas liquids to petrochemicals is more durable and more sustaining than the value uplift from crude to refined products.

Move on and talk just a couple macro slides if I can. Here's midstream. These are our expectations for midstream growth. 2010, over 2 million barrels a day. We think by the end of the decade, between 3 million and 5 million barrels a day of natural gas liquids production. This is creating tremendous investment opportunities in the industry for gathering, processing NGL fractionation; LPG export. We think the industry will invest between $100 billion and $150 billion in new infrastructure.

We continue to think that expanding in US petrochemicals makes sense. By the end of the decade, we see between 600,000 and 1 million barrels a day of new ethane in the US. We think the US is going to be a competitively advantaged place to make petrochemicals. In fact, we think it's the best place in the world to make petrochemical investments today.

Fundamentally, we believe that our olefins and polyolefins chain, because of this global leading technology position and global leading market position and the fact that we have concentration of assets in the Middle East and North America, this asset will continue to be the highest-returning asset in our portfolio, and it's one we want to grow.

Moving on to the refining macro environment. You can see significant growth in crude coming from Canada, Texas, and North Dakota. This production is going to displace crudes that have historically been imported in the US. By the end of this decade, we expect to have displaced most of the light and medium sweet crudes and a majority of the other crudes. We think this translates into advantages for US refining and good margins for the industry.

So we understand the risks that are inherent in our business; we are experienced at managing these risks. We have proven ourselves capable of managing complex mega-projects in our industry. For example, our Wood River Coker refinery expansion, we call it the CORE project -- $4 billion, on time, on budget, flawless start-up, well-executed project.

DCP is a very experienced project manager. Two big pipes: Sand Hills, Southern Hills. About $1 billion each. On time; on budget; well-executed project. CPChem, very capable project manager. The past 12 to 14 years, five mega-projects in the Middle East. As you think about that environment, very complex, very competitive environment; not unlike the environment we're going to face on the US Gulf Coast in the next five to seven years. Well-executed projects.

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Speaking about the dock itself, we have the -- this dock will have the capability to load eight VLGC carriers -- or cargoes of propane and butane each month. That's about 150,000 barrels a day.

We have the capability to expand that by an additional four cargoes to make that a much more significant asset, and we are currently in conceptual development to expand the concept now to include condensate splitting in the area and to include other NGL fractionators.

So we are laying the groundwork for a much larger and involved and more purposeful NGL business that's based on the asset footprint that we have at Sweeny. So we are excited about that, and it's a major step in our growth program for the Midstream business at Phillips 66.

I want to talk about our transportation business in some detail. We get quite a bit of questions about that, and I think this lays the groundwork for its size and scale and opportunity it has, particularly as it ties back to PSXP, our MLP.

So, when you talk about transportation, again, we are talking about crude oil logistics, we're talking about our rail assets, we're talking about Jones Act ships that we move to get crudes to our markets, and then, we're talking about increasing export capability.

Overall, this segment generated about $400 million of EBITDA in 2013. We project that would be about $500 million in 2014. You can see that we are ramping up the capital spending as we capture these opportunities, talking about doubling it to about $400 million of opportunity space there as we look at ways to continue to increase our connectivity, expand our pipeline system, and add services to our terminals to capture the opportunities that we see in the marketplace.

I got four maps here to talk about our main operating regions and talk about the assets that we have and the opportunity set that we have. A really critical area for us where we have a significant amount of transportation infrastructure is in the Midcon region, right in the heart of the [century]. We've got three Phillips 66 operating refineries in this region. It's a very significant part of our operation, and the pipeline system plays a very important role both in delivering crudes to the refineries, as well as moving products to markets, and we're a long way from some of the markets, so it's a critical piece getting value in this particular system.

The Gold pipeline we will talk about a bit later, but that was recently acquired by PSXP to show you how that begins to fit with our overall Midstream strategy.

I think the interesting thing about the Midcon for us, even though we've got 3,700 miles of pipeline here, is that it's coincident with what's happening in the oil and gas development in the area, and given our asset footprint, because of our history here, we've got a lot of right-of-way, a lot of pipelines that allow us to look at options to bring new crudes into our system, but also provide market access for other producers and opportunities to do that. So it's a very active area for development that we are currently working on many projects to expand our presence and the opportunity set there.

The second point I'd make is that in this system, we also include Explorer Pipeline, which runs from the Gulf Coast. It's a product pipeline that runs from the Gulf Coast to Chicago, and we recently increased our ownership interest in the last quarter by 6% to 19.5% in that pipeline system. It is one of the major product pipelines in the US.

The story and the transportation system in the Rockies is very similar to the Midcon. We've got a great asset base in terms of pipelines, but a relatively small refining presence with our 60,000-barrel a day Billings Refinery. But we deliver crudes, primarily Canadian crudes, into Billings via the Glacier Pipeline that we jointly owned with Plains.

And then we distribute the products east -- or excuse me, west and south out of Billings into markets in the upper Rockies, eastern Washington, and now increasingly -- increasing connection to the south to markets in Salt Lake, and even having access now with the UNEV Pipeline to Las Vegas.

So it's an area that is fairly small, but taken together, our transportation system, our refining business, and the marketing opportunities that we have in this area, this is one of our most profitable regions and it's one that we continue to find ways to invest and grow because it is a very valuable piece of our portfolio.

As I look at the west coast, we have a relatively small footprint in the west coast in terms of pipelines, about 600 miles of pipe. Most of that is really directed toward crude that we access in central California and then move to Los Angeles or Rodeo refineries or Santa Maria Refinery there.

We have about 100 miles of product pipe in that system, as well. We also have some very high-volume terminals. But I think the real story in the transportation section on the west coast, it's really about our rail connectivity, so we are currently in the process of completing a 30,000-barrel a day rail rack to unload crudes at our Ferndale, Washington, refinery and we're in the permitting process for a 20,000-barrel a day rack at Santa Maria, and we hope to see that one advance soon.

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We expect Ferndale to be operational later this year, and on top of that, we are continuing to find ways to do third-party unloading to increase crude supply to the west as well, and we just recently signed a deal with Plains in Bakersfield, California, to put Canadian crudes into that pipeline system for delivery to our refining system.

So we are continuing to find ways to get new crude sources, particularly inland crudes, into the west coast and improve its competitive position, but that is a key function and key driver and focus for us on the west coast in transportation.

The final region that I wanted to show in some detail is the Gulf Coast, and again, it's not a huge system in terms of our own pipelines, but it's a very active area, a number of large systems there that connect to that, and the dynamics of this region are changing rapidly. You've got a lot of new crude sources pushing in from the Permian, from Cushing, coming into the Gulf Coast, and there have been a number of bottlenecks now developed to getting that crude to the refining system on the Gulf Coast or to other parts of the refining system in the US.

And so, we've been very active, increasing our connections and our capability to get those crudes into our refining system and to provide access to docks and other ways to get the crude into the system. In fact, in this area, we do run MR tankers across from Corpus to our refining system in Louisiana and occasionally to Bayway to capture that, and I think you'll continue to see those solutions develop and you'll continue to see opportunities for new pipelines, particularly on the crude oil/natural gas liquids side, to keep those products moving to markets and the refining centers on the Gulf Coast.

So I have touched on this a little bit, but I don't think any discussion on transportation today in the US when you think about the crude side of our business would be complete without a discussion around rail and marine. And this map shows a more comprehensive view of how we are servicing the needs for our refineries and supplementing that from what's traditionally been either marine oceangoing supply or pipeline supply.

So, we have a very active program to move south Texas crudes along the Gulf Coast with two MR-class tankers. We have 14 barges that are currently in crude service. We have 42 others in different services, and we have the ability to flex that barge capacity between crude and other services, so we have an opportunity to continue increase our delivery with that.

We are also now going to be able to load crude out of our Freeport dock, where we used to receive it by barge out of south Texas, so it's freeing up some capacity and opportunities for that.

We have been very active in the rail space. To do this, we talked about the rail rack at Bayway that comes up later this year. We've got a 70,000-barrel a day rail rack that will be coming up this quarter at our Bayway refinery, so taken together, we've put 100,000 barrels a day of additional rail and loading capacity for us on the east and the west coast, and to supplement that, we are continuing to grow our third-party connections to bring even more crude into the system, and we talked about Bakersfield in terms of unloading in California. Though also on the sourcing side, we developed new agreements recently in the past several months at Hardisty, Alberta, which lets us access heavy Canadian crudes, Berthold, North Dakota, for Bakken, and then at Casper, Wyoming, we've also got capacity there, which would allow us to bring crudes into California or other parts of our refining system from there.

So we are continuing to progress that, and I think rail will continue to be a piece of the solution for us. So Greg mentioned our fleet started out at 2,000 new railcars we took delivery of in 2013. We will take -- we will put 1,200 more cars in service in 2014, and in terms of capacity, that means that the 2,000 cars that delivered about 100,000 barrels a day, the 3,200 cars will increase that capability to 160,000 barrels a day.

So on top of that, we've got additional third-party commitments that let us really flex that rail system, and we ultimately see rail probably being 5% to 10% of our crude supply in North America because the pipeline capacity just isn't there to make that happen.

So, I think before I leave and talk about DCP and the Midstream, I think this is a slide that we've been anxious to show everybody because it really says what's the impact of all the growth projects that we are talking about in our Midstream business.

So last year, in 2013, we had $0.5 billion of EBITDA in the Midstream business. And we're going to grow that to $1.5 billion in 2017 with the projects that we just talked about and the opportunities. Half of that comes from the Sweeny NGL hub; a quarter comes from operations that are currently embedded in refineries, such as storage, docks, and terminal assets; and another quarter will come through additional transportation growth in our pipeline and terminal system. These are all very solid projects, so we are talking about a tripling of our Midstream EBITDA, and I think that really speaks to the opportunity that we see to grow the Midstream business in both Phillips 66, but just as importantly to grow for Phillips 66 Partners, our MLP.

So we currently own 73% of PSXP as a limited partner and we own the 2% GP as well. We have talked about top quartile distribution growth for that. It's important to have that backlog of EBITDA and the project backlog to drive that.

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The real challenge for us is to continue to increase that connectivity to some of our light processing refineries on the east and the west coast, hence the comments around rail and the logistics solutions that we look for to do that. But overall, we think we're in great shape to take advantage of the changing crude supplies -- crude slate in North America through our system.

We talked in 2012 at the analyst meeting about a $500 million improvement in refining and refining net income on a constant margin basis. We're delivering on that. We continue to make that progress.

In this chart, you can see about half of that improvement will come from increased runs of advantaged crudes. About a quarter -- or the other half will come from yields improvements, as well as increased exports, and overall when you look at our asset base today, our five-year average on refining return has been about 11%. We see that growing by 4 percentage points to about 15%. So continuing to see stronger business in our base refining business and taking steps to really work that, and I'll talk in more detail about some of those.

The biggest piece of that, of course, is how do we get lower-priced, higher-value crudes in the front end of our refinery? It's the number one competitive advantage that we have, and we spend a lot of time between our commercial, refining, transportation groups to drive that.

We've talked a bit about our light oil capability or heavy oil capability. We talked about the rail system that will increase the connectivity and the supply of that. Those are all actions that we have taken, and the result has been that we've increased our utilization of advantaged crudes from 62% in 2012 to 74% in 2013, and so far this year, we have average 90% advantaged crude.

And part of that is the fact is how you define advantaged, and for simplicity, we define advantaged as crudes that land at our refineries at a discount to landed Brent. So, the big change for us in North America has been the relative discounting of LLS and ANS as these inland crudes have now made it to the places where refiners didn't have those options in the past and those crudes have begun to discount.

So a significant change there and one that we think will be enduring. They will certainly move around, but I think the increased supply and competition has changed that and made that a bigger part of what we do.

The other thing that we like to do with crude is we like to gather local crude, very consistent quality, high value at our refineries, so crude-on-crude substitution, even within light tight oil, is important to us, and we also like to make sure that we have the capability to have options in our waterborne refineries that have access to waterborne crudes that we can maintain the optionality on those as well. So, we'll continue to evolve that.

I would say that finally on advantaged crude, the real issue today is logistics. It's about how to get those crudes out of the central part of the US and put more of that into the east and the west coast, hence why we work on that so much in our organization.

Just a couple of comments on yields. We have talked about this in the past. We have an industry-leading distillate yield of 40% today. The industry average is 37%. We see that going to 41% through optimization of our operations.

We are continuing to look at ways to increase our clean product yield, so we see that increasing from 84% to 85%, and that's really driven off of two things -- increased recovery of LPGs where we burn those as fuel today in some refineries, and then increasing conversions on some of our lower-valued fractions in our key operating units, like FCCs or hydrocrackers, where we get to convert at a higher percentage those low-valued fractions into higher-valued fractions. Overall, a one-point change in clean product yield yields about $100 million in net income for the refining business.

The export story, Greg touched on this, but it's just a great story for us. We have increased our export capacity and our export shipments substantially over the last two years, and we did that without spending a lot of capital. It really came through a concerted organizational effort between commercial and refining to find ways to optimize dock space and remove constraints and meet product specs that met export specifications.

And we have now revised our estimates of what our capability for exports will be. We see that growing from just over 400,000 barrels a day at 2013 to over 550,000 barrels a day in 2016, and most of that change comes in the Gulf Coast. And at 550,000 barrels a day, 25% of our US output could be exported and 42% of our US coastal refining capacity could be exported, and we think that's critically important as the US continues to have high crude runs, relatively flat product demand, and this is an opportunity to take that length and supply markets, particularly in the Atlantic Basin, with increased product supply out of the US that's very competitive. So we feel there's strong market pull for this, as well as strong operating push behind that part of the export business.

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EXHIBIT 2

DECLARATION OF RYAN P. CAILLIER

I, Ryan P. Caillier, declare:

1. I am employed by Phillips 66 Company ("Phillips 66"), and I provide this declaration in support of Phillips 66's opposition to the *Appeal of Approval and Certification of the Final Negative Declaration for the Phillips 66 Carson Crude Oil Storage Capacity Project* filed by Communities for a Better Environment ("CBE Appeal"). I have personal knowledge of the facts set forth in this declaration and if called as a witness, I could and would testify competently to them.

2. I am an analyst in the Phillips 66 Investor Relations Group. I have held this position for approximately one year. Prior to joining the Investor Relations Group, I was an analyst in the company's Treasury organization and its Commercial organization. The latter is the corporate group responsible for buying and selling crude oil, other feedstocks, and products. Altogether, I have been employed by Phillips 66 and its predecessors (including ConocoPhillips Company) for approximately three years.

3. In my current position in the Investor Relations Group I support the Manager and the Vice President of Investor Relations by, among other things, preparing slides and other materials for presentations and other communications with investors, potential investors, financial analysts and others.

4. I have reviewed Exhibit J to the CBE Appeal petition. Exhibit J is set of presentation slides entitled *Investing, Building, Growing – Phillips 66 Investor Update, Third Quarter 2014,* ("Investor Update Presentation"). I assisted in preparation of this presentation, and I am the author of Slide 11.

5. By their very nature, presentation slides are incomplete communication. They serve as a backdrop as the speaker orally communicates with the audience. The speaker communicates the primary message, including context and narrative, and the slide plays a supporting role.

6. Slide 11, entitled Transportation – West and East Coast, depicts a variety of Phillips 66 transportation components on the east and west coasts of the United States. My primary purpose in preparing this slide was to identify options for moving crude oil by rail, including the

location of Phillips 66 refineries in relation to the rail network and the location of facilities where Phillips 66 had access through commercial agreements. The slide presents a generalized view of potential options for discussion purposes; it does not present information regarding transportation routes that were then in use or that the company intended to use.

7. Slide 11 shows a rail connection from Berthold, ND to a commercial agreement location in Oregon, and an arrow indicating waterborne options from there to Phillips 66 refineries in Ferndale, Rodeo and Los Angeles. At the time I prepared the slide, I was aware that Phillips 66 was capable, through a commercial relationship, of loading crude oil onto barges. I was aware that this route had been used to deliver crude oil to the Ferndale and Rodeo refineries via barge. I was not aware of any shipments via barge or marine vessel from Oregon to the Los Angeles Refinery, nor was I aware of any plan for the company to do so. The Declaration of Maureen McCabe, filed concurrently herewith, describes the limitations on any such shipments.

8. Slide 11 in the Investor Update Presentation originated in an earlier presentation entitled *Investing, Building, Growing – Phillips 66 2014 Analyst Meeting, April 10, 2014* ("Analyst Meeting Presentation"), excerpts from which are attached as Exhibit 1 to my declaration. I assisted in the preparation of the Analyst Meeting Presentation.

9. Slide 33 in the Analyst Meeting Presentation, which I also authored, contains the same graphic as Slide 11 in the Investor Update Presentation. In addition, Slide 33 contains text that further explains the graphic. As the text shows, the graphic was intended to provide general information on rail and marine transportation. The text notes 14 crude barges, which correspond to the barges used to transport crude oil on inland and coastal waters in the United States to certain Phillips 66 refineries, including the Ferndale and Rodeo refineries. The text also notes two Jones Act ships, and these ships correspond to the red arrows emanating from Corpus Christi, Texas to Phillips 66 refineries elsewhere along the Gulf Coast and the Bayway Refinery in New Jersey.

10. Slide 33 in the Analyst Meeting Presentation summarize slides 29 through 32, which discussed transportation in four regions of the United States. Slide 31 pertains to the West Coast Region. Slide 31 does not identify marine routes for transporting inland crude to West Coast terminals. At the April 10, 2014 Analyst Meeting, Slides 29 through 33 were presented by Mr. Tim

Taylor, then Executive Vice President of Commercial, Marketing, Transportation and Business Development. With respect to Slide 31, Mr. Taylor discussed pipeline assets and then emphasized rail connectivity; he did not mention marine transportation to the West Coast. (See Phillips 66 Analyst Meeting, April 10, 2014, edited transcript, which is Exhibit 2 to the Declaration of Mr. Darin Fields, filed concurrently herewith, at p. 8-9.)

I declare under penalty of perjury under the laws of the State of Texas that the foregoing is true and correct.

Executed this 29 day of January, 2015, in Houston, Texas.

RYAN P. CAILLIER

EXHIBIT 1

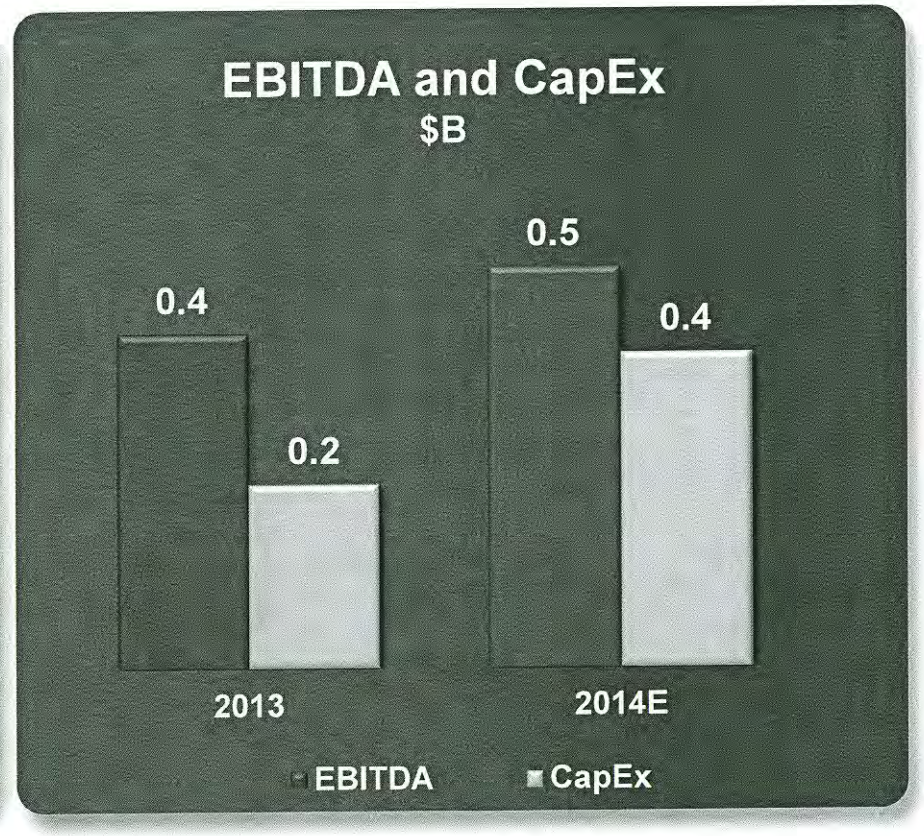


2014 Analyst Meeting

April 10, 2014
New York, N.Y.

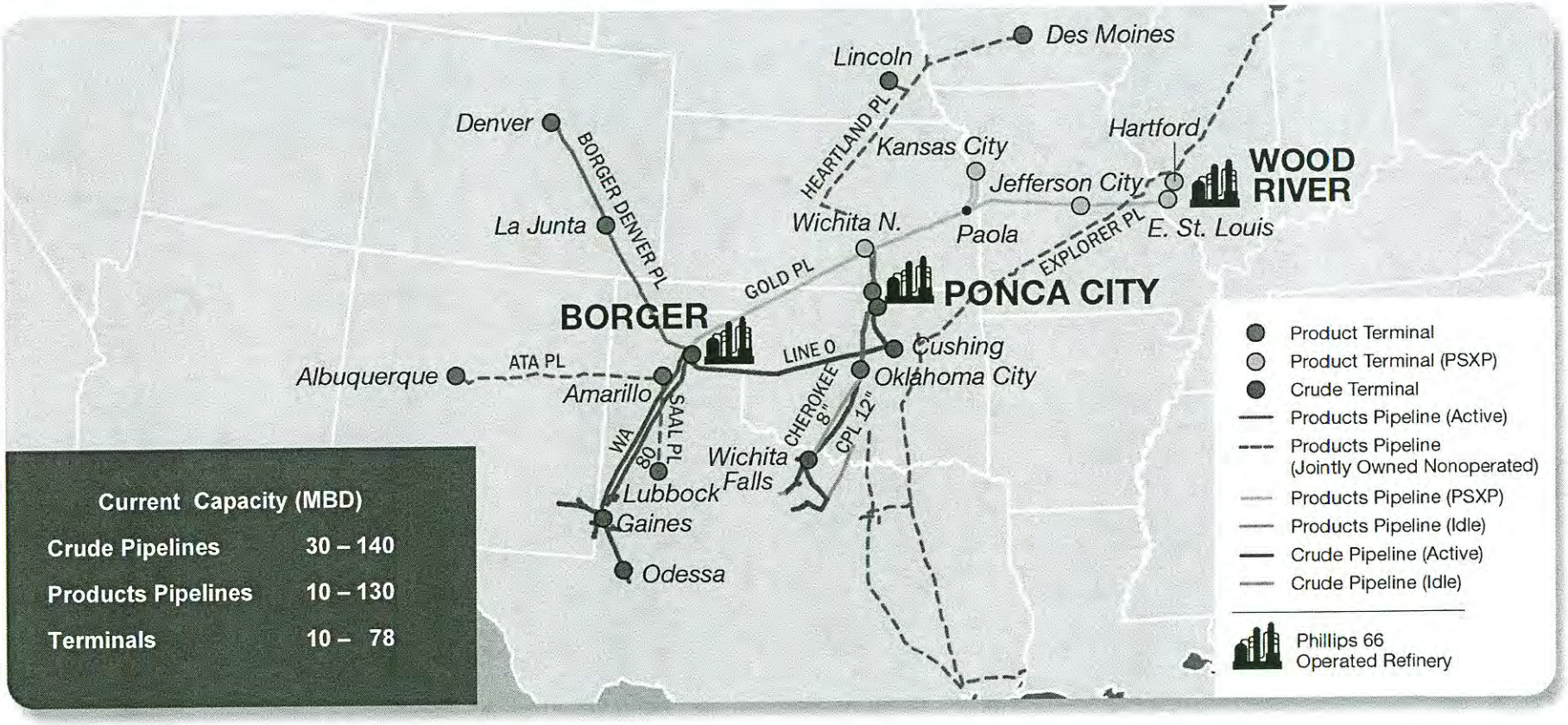
Transportation

- Crude oil logistics
- Rail cars
- Jones Act ships
- Refined product exports

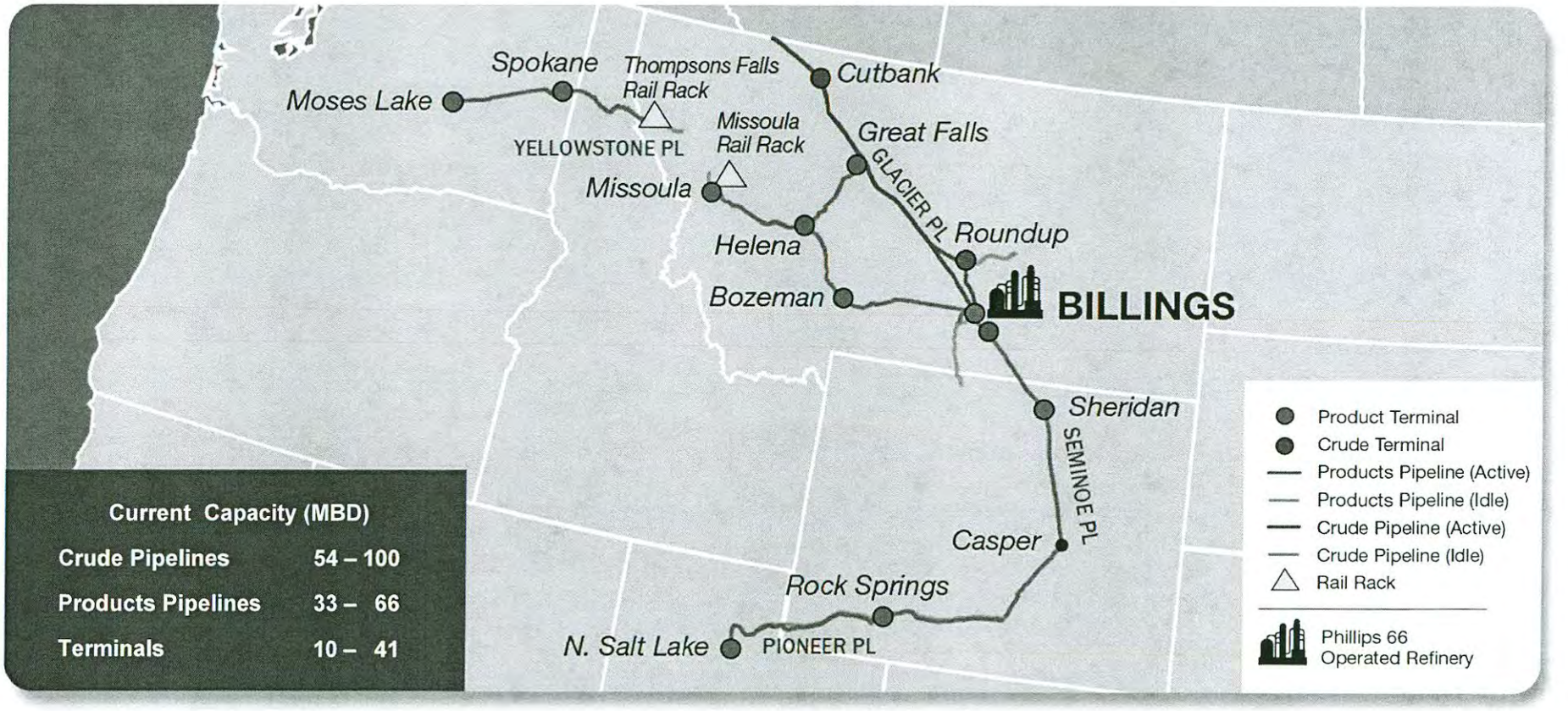


Transportation EBITDA includes noncontrolling interests.

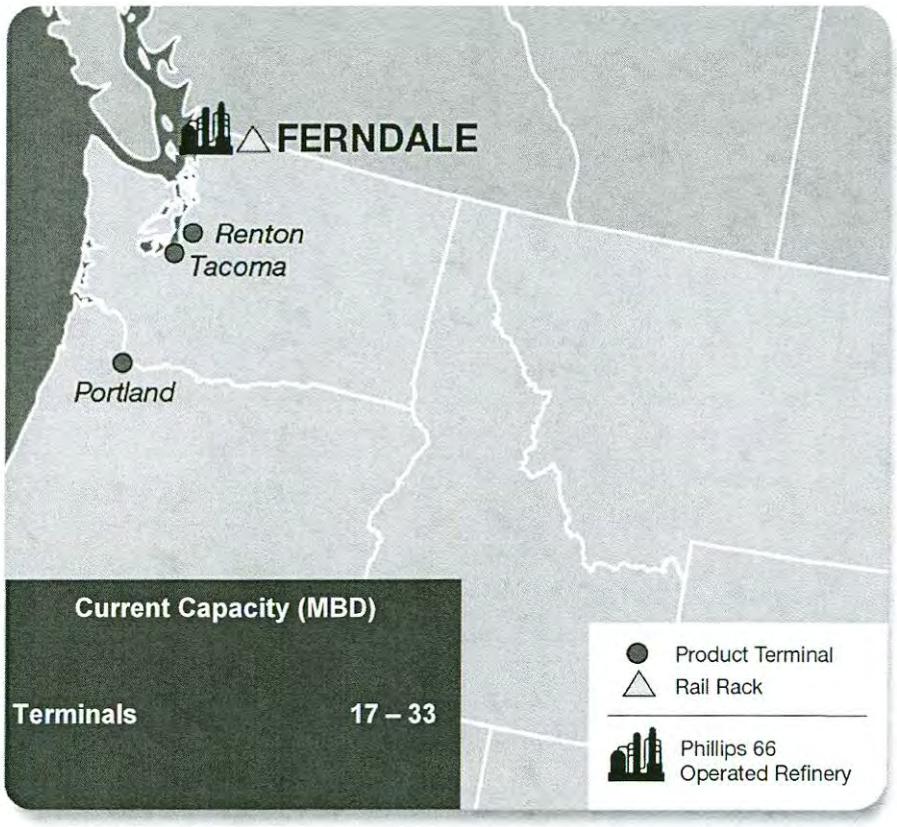
Transportation – Midcon Region

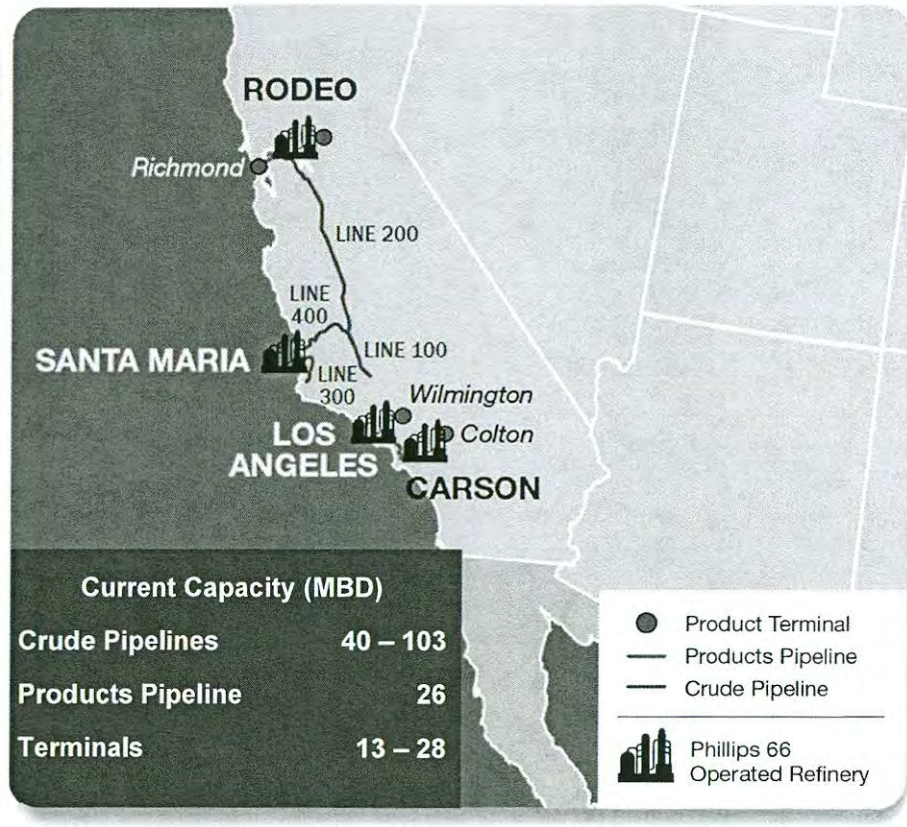


Transportation – Rockies Region

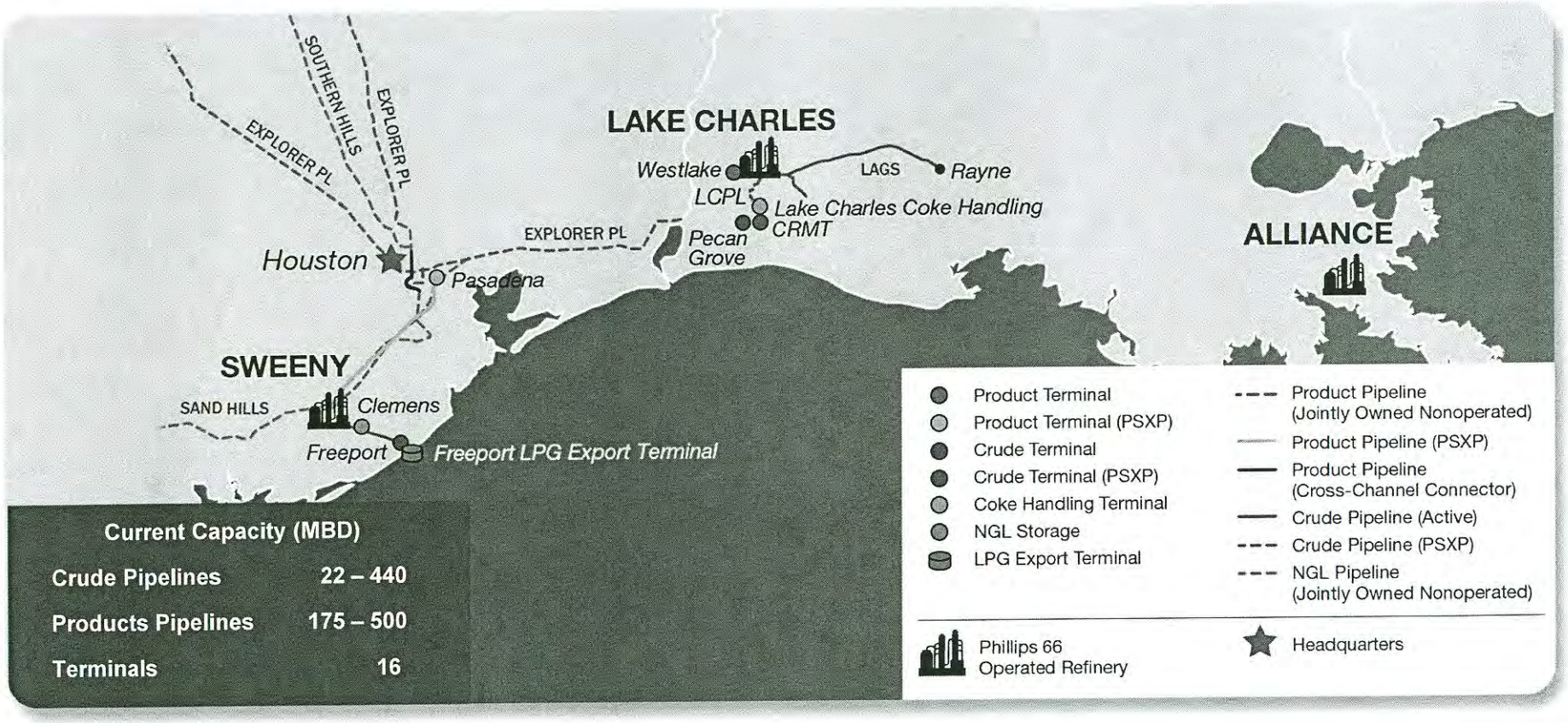


Transportation – West Coast Region

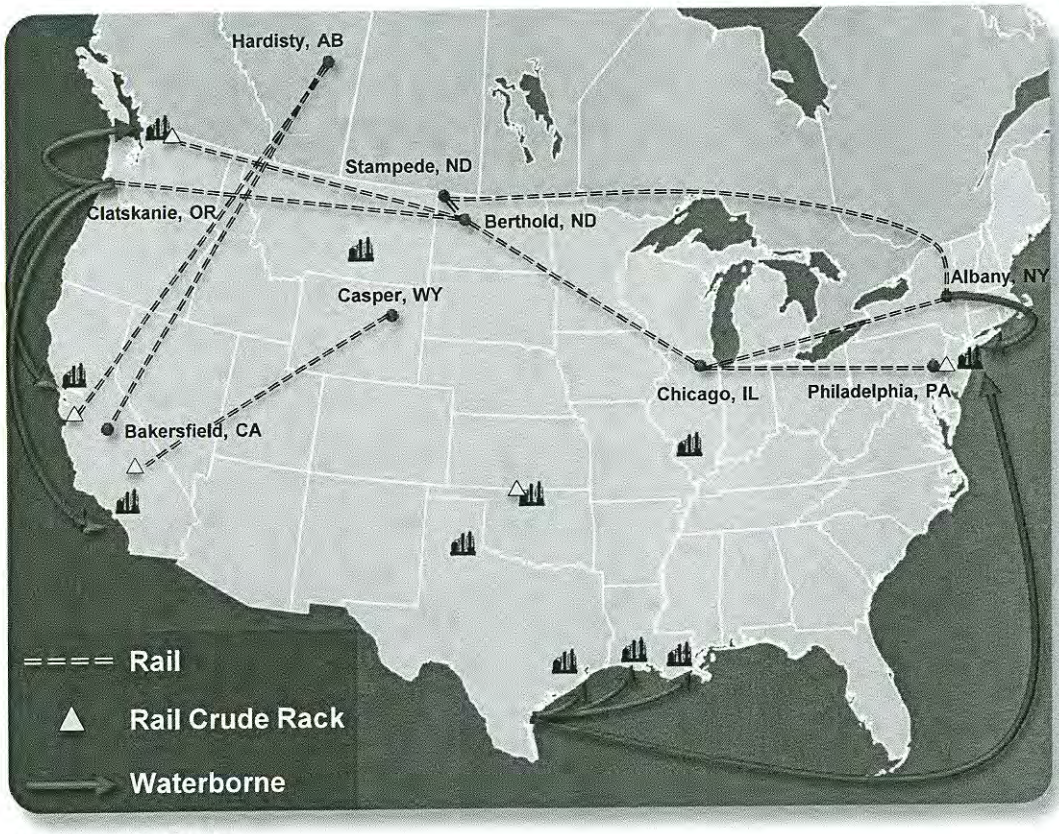




Transportation – Gulf Coast Region



Transportation – Rail and Marine



Enhancing logistics optionality

- 2 Jones Act ships
- 14 crude barges
- Freeport crude loading

Increasing crude rail capability

- 5 rail unloading facilities
- 1,200 additional rail cars

See appendix for footnotes.

EXHIBIT 3

DECLARATION OF MAUREEN McCABE

I, Maureen McCabe, declare:

1. I am the West Coast Domestic Crude Trader for Phillips 66 Company ("Phillips 66"). I make this declaration in support of the Phillips 66 opposition to the *Appeal of Approval and Certification of the Final Negative Declaration for the Phillips 66 Carson Crude Oil Storage Capacity Project* filed by Communities for a Better Environment ("CBE Appeal"). I have personal knowledge of the facts set forth in this declaration and if called as a witness, I could and would testify competently to them.

2. I have held the position of West Coast Domestic Crude Trader since 2008. Altogether, I have been employed by Phillips 66 and its predecessors (including ConocoPhillips Company and Conoco Inc.) for over seventeen years. Eleven of these years, I have been involved in crude trading, procurement, or delivery.

3. In my current position, my responsibilities include purchasing crude and optimizing crude supply for the Phillips 66 West Coast refineries. I am familiar with the equipment and operations of the Los Angeles Refinery as they affect my responsibilities for procurement of crude oil and other feedstocks.

4. Selection of crude for a refinery involves a number of factors. The crude must be compatible with the refining equipment and configuration, either alone or as blended with other crudes, to ensure that the crude can be refined by the refinery in question safely, reliably, and in compliance with environmental and other laws. The crude should present the highest value relative to other available crudes considering the crude characteristics, the refinery configuration, and the products the refinery intends to produce. It also must be feasible to deliver the crude to the refinery utilizing available transportation networks.

5. Cost also is a factor in selecting crude. Currently, one corporate objective is to refine what the company refers to as "advantaged crude." As described in more detail in the Declaration of Darin Fields, advantaged crude means crude that costs less than benchmark Brent crude. For a particular refinery, advantaged crudes are selected from among the range of crudes compatible with the design and desired product slate for that refinery, and that can feasibly be

delivered to the refinery.

6. The cost comparison for determining whether a crude is advantaged is based on the "landed" price at a particular location. The per barrel acquisition price of the crude and transportation costs usually make up the majority of the landed cost of a crude.

7. Transportation costs vary significantly depending upon the mode of transportation, e.g., truck, pipeline, train, marine vessel, barge or some combination of these. Transportation costs are also affected by distance, by equipment availability, or potentially by constraints along the route. For example, it generally costs more per barrel to transport crude oil by rail from the Midwest to California than it does to transport the same crude oil to the East Coast.

8. On occasion, a shipment of crude oil is considered advantaged because unexpected events cause the crude to be offered at a discount. For example, if another company purchases crude oil but then suffers an unexpected breakdown and cannot receive it, we are sometimes able to negotiate purchase on favorable terms due to the distressed circumstances. We call these "distressed crudes." It is impossible to forecast where distressed crudes will originate, because the price advantage is unrelated to the factors that usually affect price.

9. The Los Angeles Refinery currently refines essentially 100% advantaged crude. Over the past 10 years, the majority of the crude processed at the Los Angeles Refinery has originated in the United States, Canada, Ecuador and Iraq. (See Final Negative Declaration p. F-46.) The table below compares the estimated landed costs of crudes representative of the crudes we run from those countries to a published posted price for Brent crude. If a landed price were used for Brent crude, the table would show that the cost advantage of the other listed crudes is greater.

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L.A. Crude Pricing vs. Brent, $/BBL	2011	2012	2013	2014
Brent (1)	110.85	111.64	108.67	99.56
CA Midway Sunset (2)	104.52	104.93	102.57	91.72
Ecuador Oriente (3)	103.78	103.60	99.10	91.03
Iraq Basrah Light (4)	108.96	108.19	103.69	95.76
Canadian Heavy (5)	97.45	92.51	92.75	89.71
Bakken (delivered by water) (6)	N/F	N/F	N/F	N/F

Price Differential vs. Brent, $/BBL				
CA Midway Sunset	(6.33)	(6.72)	(6.10)	(7.84)
Ecuador Oriente	(7.07)	(8.04)	(9.57)	(8.53)
Iraq Basrah Light	(1.88)	(3.45)	(4.97)	(3.80)
Canadian Heavy	(13.39)	(19.13)	(15.92)	(9.85)
Bakken (delivered by water)	N/F	N/F	N/F	N/F

Notes:

1. Argus Ice Brent
2. CA Postings for MWSS; plus $1.70/bbl Plains pipeline tariff & 0.10% loss allowance
3. Argus Oriente Month, FOB pricing + $3.65/bbl marine transportation & dock fees (2011 - May 2014) (Platts FOB June 2014 - forward)
4. Argus Basrah Trade Month, FOB pricing + OSP + estimated freight
5. Published Western Canadian Select @ Edmonton + pipeline tariffs + premium fees (4Q14 assumes same PL Premium as 3Q2014) to Westridge dock + estimated marine freight
6. N/F = Not Feasible

10. Bakken crude oil may be considered an advantaged crude for some Phillips 66 refineries, but Bakken crude oil transported via marine vessel is not currently considered an advantaged crude for receipt at the Los Angeles Refinery. As explained in Paragraphs 4, 5 and 6, advantaged crudes are selected from among the crudes compatible with the design and desired product slate for the refinery in question, and that can feasibly be delivered to the refinery. The Los Angeles Refinery does not receive Bakken crude by marine vessel, and it is not feasible to do so.

11. Hypothetical routing of Bakken crude to Los Angeles via marine transport would require the crude to first be shipped via rail from North Dakota to the Pacific Northwest, transferred to a barge or marine vessel, and shipped south to Los Angeles. There are multiple logistical obstacles to doing this. Phillips 66 cannot load crude oil in the Pacific Northwest onto vessels that can be unloaded in the Los Angeles area. Phillips 66's Ferndale Refinery has a rail rack and a marine terminal, but it does not have authority to transship crude oil received at its rail

terminal out through its marine terminal. Phillips 66 is not aware of any transload facility in the area capable of loading crude from rail onto anything other than barges or potentially marine tanker vessels classified as "MR," which are smaller than Panamax sized ships. In Southern California, Phillips 66 has a commercial arrangement to receive crude at Berth 121 in the Port of Long Beach. (Berths 148-151 in the Port of Los Angeles are considered part of the Los Angeles Refinery, but this is not a crude terminal.) Berth 121 is not designed to receive either barges or ships smaller than Panamax, and there is no proposal to modify the terminal in order to do so. Therefore, a barge or MR vessel loaded with Bakken crude in the Northwest would have to reverse lighter its cargo to a Panamax or larger sized ship in order to offload at Berth 121. The logistical obstacles make this routing for Bakken crude impractical, and the multiple transshipments would add substantial costs.

12. Bakken crude does not compare favorably with advantaged crudes currently run at the Los Angeles Refinery, and the added cost of a hypothetical marine transportation route would exacerbate the disadvantage of refining Bakken crude in Los Angeles.

13. The Crude Oil Storage Capacity Project will not make it feasible to transport Bakken crude to Los Angeles via Berth 121 because it will not remove the logistical obstacles described in Paragraph 11.

14. The Crude Oil Storage Capacity Project will not facilitate transport of Bakken crude to the Los Angeles Refinery. As noted, facilities in the Pacific Northwest are capable of loading crude onto barges and small marine tanker vessels. Even if Phillips 66 could receive these vessels in Southern California, the Project does nothing to facilitate it. The Project involves construction of a larger storage tank to enable larger ships to offload in a single ship call. The existing tanks would be able to receive the full cargo of a barge or a small marine tanker without modifications to the equipment or the permits. Therefore, the Project does nothing to facilitate delivery of Bakken crude to Los Angeles.

15. Canadian heavy crudes, including what CBE calls "tar sands" crude, are currently refined at the Los Angeles Refinery and are considered advantaged. The Crude Oil Storage Capacity Project will not cause an increase in the amount of Canadian heavy crude delivered to Los Angeles. Canadian heavy crude is not transported to the refinery using the Suezmax and

larger vessels that currently must unload in two ship calls.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed this ___ day of January, 2015, in Los Angeles, California.

Maureen McCabe

EXHIBIT 4

RECEIVED
OCT 21 1994
RVB

ORIGINAL FILED
OCT 19 1994
LOS ANGELES
SUPERIOR COURT

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF LOS ANGELES

RALPH ATTWOOD, JR., ROBERT W. JOHNSTON, and UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA, LOCAL UNION NO. 250, Petitioners and Plaintiffs, vs. SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, Respondent and Defendant, CHEVRON U.S.A. PRODUCTS COMPANY, Real Party in Interest.	Case No. BC093076 [redacted] ORDER

This matter came on regularly for hearing before the Court, the Honorable Diane Wayne, Presiding, on August 2, 1994. Thomas R. Adams and Ann Broadwell appeared as attorneys for Petitioners. William B. Wong and Frances L.

Keeler appeared as attorneys for Respondent, the South Coast Air Quality Management District. Ronald E. Van Buskirk and Betsy G. Stauffer appeared as attorneys for Real Party in Interest, Chevron U.S.A. Products Company. Gail Feuer and Everett DeLano appeared as attorneys for *amici curiae* Natural Resources Defense Council and Citizens for a Better Environment.

The Court, having issued its written Tentative Ruling, copy attached hereto, and having reviewed and considered the record, the evidence and arguments set forth in the papers submitted by counsel, and having heard and considered the oral argument of counsel at the hearing, enters the following order:

1. For the reasons given in the Tentative Ruling, the matter is remanded to Respondent to set aside its certification of the Environmental Impact Report (EIR) and for further proceedings in accordance with CEQA and the Court's Ruling to clarify who is to certify the EIR, and who (or what entity) is to review and consider the EIR, as well as who is to adopt the findings, statement of overriding considerations and the mitigation monitoring plan for the Chevron project.

2. Respondent shall serve and file a return evidencing its compliance with this Order by October 11, 1994.

3. Ongoing project construction and operations under permits previously issued by Respondent are permitted to continue pending Respondent's return to this Court.

IT IS SO ORDERED.

Dated: _____.

_____
The Honorable Diane Wayne
Judge of the Superior Court

Approved as to form:

PILLSBURY MADISON & SUTRO
Ronald E. Van Buskirk
Betsy G. Stauffer

By _____

Attorneys for
Real Party in Interest

SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT
William B. Wong
Frances L. Keeler

By _____

Attorneys for Respondent

ADAMS & BROADWELL
Thomas R. Adams
Ann Broadwell

By _____

Attorneys for Petitioners

3. Ongoing project construction and operations under permits previously issued by Respondent are permitted to continue pending Respondent's return to this Court.

IT IS SO ORDERED.

Dated: _____.

_____
The Honorable Diane Wayne
Judge of the Superior Court

Approved as to form:

PILLSBURY MADISON & SUTRO
Ronald E. Van Buskirk
Betsy G. Stauffer

By _____

Attorneys for
Real Party in Interest

SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT
William B. Wong
Frances L. Keeler

By _____

Attorneys for Respondent

ADAMS & BROADWELL
Thomas R. Adams
Ann Broadwell

By _____

Attorneys for Petitioners

3. Ongoing project construction and operations under permits previously issued by Respondent are permitted to continue pending Respondent's return to this Court.

IT IS SO ORDERED.

Dated: _____.

_____
The Honorable Diana Wayne
Judge of the Superior Court

Approved as to form:

PILLSBURY MADISON & SUTRO
Ronald E. Van Buskirk
Betsy G. Stauffer

By _____

Attorneys for
Real Party in Interest

SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT
William B. Wong
Frances L. Keeler

By _____

Attorneys for Respondent

ADAMS & BROADWELL
Thomas R. Adams
Ann Broadwell

By _____

Attorneys for Petitioners

3. Ongoing project construction and operations under permits previously issued by Respondent are permitted to continue pending Respondent's return to this Court.

IT IS SO ORDERED.

Dated: OCT 19 1994.

DIANE WAYNE

The Honorable Diane Wayne
Judge of the Superior Court

Approved as to form:

PILLSBURY MADISON & SUTRO
Ronald E. Van Buskirk
Betsy G. Stauffer

By _____

Attorneys for
Real Party in Interest

SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT
William B. Wong
Frances L. Kessler

By _____

Attorneys for Respondent

ADAMS & BROADWELL
Thomas R. Adams
Ann Broadwell

By Ann Broadwell

Attorneys for Petitioners

chevron

Tentative Ruling

ATTWOOD V. SCAQMD

Petition for Writ of Mandate: Grant

The petition for writ of mandate is granted pursuant to Public Resources Code § 21168.5 and under the substantial evidence standard of review as set forth in Laurel Heights Improvement Assn. v. Regents of University of California (1988) 47 Cal.3d 376, 392. ("Laurel Heights I").

Under the substantial evidence test, the court's analysis is limited to ". . . whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the agency has not proceeded in a manner required by law or if the determination or decision is not supported by substantial evidence." Public Resources Code § 21168.5. The court "must resolve reasonable doubts in favor of the administrative findings and decision." Topanga Assn. for a Scenic Community v. County of Los Angeles (1974) 11 Cal.3d 506, 514.

The court finds that respondent ("District") did not proceed in the matter required by law. The District violated CEQA by approving the project prior to the certification of the EIR and by failing to properly consider and adopt the EIR.

A writ of mandate shall issue (1) ordering the District to set aside its certification of the EIR; and (2) remanding the matter to the District for further proceedings in accordance with CEQA and this court's ruling. **However, this court specifically finds that equitable factors support the continuation of existing operations, and will as such permit such activity to continue, pending compliance with CEQA.** Laurel Heights I, supra, 47 Cal.3d at 423; Public Resources Code § 21168.9. Specifically, existing operations are required for Chevron to comply "clean fuel" mandates. 1 AR 40-41.

In light of this ruling, the court does not address the

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sufficiency of the EIR itself. This ruling is not intended to validate the EIR or to prohibit any further environmental review by the District.

I. Approval of project prior to certification of the EIR.

Phase I of the project was "approved" prior to the certification of the EIR and issuance of the permits on 10/25/93.

In reviewing actions undertaken by an agency, the court "'does not pass upon the correctness of the EIR's environmental conclusions, but only upon its sufficiency as an informative document.'" Laurel Heights I, supra, 47 Cal.3d at 392 (quoting County of Inyo v. City of Los Angeles (1977) 71 Cal.App.3d 185, 189). The court should not demand perfection but only a demonstration of an objective, good faith effort to comply. Mount Sutro Defense Committee v. Regents of Univ. of California (1978) 77 Cal.App.3d 20, 37.

The purpose of an EIR is "to identify the significant effects of a project on the environment, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided." Public Resources Code sec. 21102.1(a). The purpose of an EIR is to inform the public and governmental agencies of the environmental of a proposed project. No Oil, Inc. v. City of Los Angeles 13 Cal.3d 68, 86. The EIR must contain a meaningful discussion of both mitigation measures and project alternatives. Laurel Heights, 47 Cal.3d at 401-403.

While the EIR must indicate a good faith effort at full disclosure, it need not be perfect nor must it contain an exhaustive analysis of all issues. CEQA Guidelines section 15151; Kings County Farm Bureau v. City of Hanford (1990) 221 Cal.App.3d 692. "A prejudicial abuse of discretion occurs if the failure to include relevant information precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals of the EIR process." Kings County, 221 Cal.App.3d at 712 (citing Laurel Heights, 42 Cal. 3d at 403-405).

And, "Public participation is an essential part of the CEQA process." (Guide. § 15201). That process is invalidated if the project begins before comment is available. Sutter Sensible Planning v. Board 122 Cal.App.3d 813.

Reformulated gasoline projects, such as the project in the instant case, are required to comply with CEQA. Public Resources Code § 21178.1. Pursuant to CEQA, an agency must consider the final EIR prior to approval or disapproval of the project. Public Resources Code § 21061; CEQA Guidelines §§ 15004, 15089; Laurel Heights I, supra, 47 Cal.3d at 394; No Oil Inc. v. City of Los Angeles (1974) 13 Cal.3d 68, 79.

As applicable to the instant case, a "project" is "the whole

of an action, which has a potential for resulting in a physical change in the environment, directly or ultimately, and is . . . . [an] activity involving the issuance to a person of a . . . permit . . . or other entitlement for use by one or more public agencies." CEQA Guidelines § 15378(a)(3); Public Resources Code § 21065(c).

Pursuant to Public Resources Code § 21080(a), CEQA applies only to approvals of "discretionary projects," i.e., those projects which "[require] the exercise of judgment or deliberation when the public agency or body decides to approve or disapprove a particular activity," as opposed to "ministerial projects" in which the agency merely determines "whether there has been conformity with applicable statutes, ordinances, or regulations." CEQA Guidelines §§ 15357, 15268.

"Approval" is defined as a decision "which commits the agency to a definite course of action in regard to a project intended to be carried out by any person." CEQA Guidelines § 15352(a); Public Resources Code § 21151. Approval of a private project "occurs upon the earliest commitment to issue or the issuance by the public agency of a discretionary . . . permit . . . or other entitlement for use of the project." CEQA Guidelines § 15352(b). However, the precise date of approval is to be determined by the agency pursuant to its own rules and regulations. CEQA Guidelines § 15352(a).

A. **Approval under District Rule 201.**

District Rule 201, which governs the issuance of a Permit to Construct, provides that:

> "A person shall not build, erect, install, alter or replace any equipment, the use of which may cause the issuance of air contaminants without first obtaining written authorization for such construction from the Executive Officer. A permit to construct shall remain in effect until the permit to operate the equipment for which the application was filed is granted or denied, or the application is cancelled."

According to the stipulated facts in this case, Chevron began the subject field activities in 2/93. In 7/93, Chevron sent a letter to Dr. Lentz, the District's Executive Officer, in order to confirm that certain field activities would be in compliance with Rule 201. Dr. Lentz's 7/7/93 letter confirmed that Chevron could place certain equipment in their final locations, but that Chevron could not make process or utility connections prior to issuance of a permit to construct. The Lentz letter advised that such work would be at Chevron's risk. The construction began prior to the completion of the EIR. Stip. pp. 4-9.

Dr. Lentz's letter was based upon the District's 11/17/89 written interpretation of Rule 201, whereby field activities require prior approval when equipment which could emit or control air contaminants is

"a) Beginning to be fabricated on-site or,

"b) In the case of equipment that is delivered fully fabricated, positioned in its final intended location and power and process connections to be made."

Respondent's interpretations of the statutes of which it must enforce and the corresponding rules and regulations are entitled to great weight. Dept. of Health Services v. Superior Court (1991) 232 Cal.App.3d 776; Ralph's Grocery Co. v. Reimel (1968) 69 Cal.2d 172. An agency's interpretation of its own regulations is controlling unless clearly erroneous or inconsistent with the regulation. United States v. Larionoff (1977) 431 U.S. 864; Carmona v. Div. of Industrial Safety (1975) 13 Cal.3d 303.

The court finds that the interpretation of Rule 201 is not unreasonable nor is it inconsistent with the rule. So long as the equipment at issue is pre-fabricated when positioned in its intended final location and is not connected or otherwise operative, the equipment may reasonably be considered as not under construction.

However, the stipulated facts indicate that the equipment was not all pre-fabricated and merely installed at their intended final locations, i.e., that actual construction was taking place. During the period of 8/93 to 9/93, Chevron began to erect a 170-foot reactor/regenerator structure and a 130-foot dehexanizer column, and to make modifications to the existing electrical substation. As of 10/23/93 (prior to the certification of the EIR), the estimated percentage completion for work on the project included the following: furnace work, 11 % complete; reactor/regenerator strucutre, 65 % complete; hydrogen net gas compressor, 14 % complete; dehexanizer column, 40 % complete; new electrical substations, 60 % complete; and modifications to existing electrical substation, 20 % complete.

Thus, the District, under its own rules, should not have permitted activity without the issuance of a Permit to Construct.

B. **Approval within the meaning of CEQA.**

Accordingly, this court finds that the District's action constituted an "approval" within the meaning of CEQA.

Notwithstanding Dr. Lentz's warning that Chevron would undertake field activities at its own risk, the District by its conduct committed itself to "a definite course of action." CEQA Guidelines § 15352(a); Public Resources Code § 21151. Pursuant to its own Rule 201, the District should have issued a permit in order to allow Chevron's activities to proceed.

Moreover, permission to undertake the subject project activities prior to the consideration and approval of a final EIR

is not permitted under CEQA.

> "A fundamental purpose of an EIR is to provide decision makers with information they can use in deciding **whether** to approve a proposed project, not to inform them of the environmental effects of projects that they have already approved. If post approval environmental review were allowed, EIR's would likely become nothing more than post hoc rationalizations to support action already taken. We have expressly condemned this use of EIR's." (Emphasis original.)

Laurel Heights I, supra, 47 Cal.3d at 394 (citing No Oil, supra, 13 Cal.3d at 79).

Thus, the EIR should be prepared "as early as feasible in the planning process to enable environmental considerations to influence project program and design and yet late enough to provide meaningful information for environmental assessment." CEQA Guidelines § 15004(b); Laurel Heights I, supra, 47 Cal.3d at 395. "With private projects, the Lead Agency shall encourage the project proponent to incorporate environmental considerations into project conceptualization, design and planning at the earliest feasible time." CEQA Guidelines § 15004(b)(1). The purpose for this requirment is to consider environmental problems at a time "where genuine flexibility remains". Sundstrom v. County 208 Cal.App.3d 296.

Timing of the preparation of the EIR is to be determined by the agency in accordance with the objectives of CEQA. Mount Sutro, supra, 77 Cal.App.3d at 36. Thus, in Mount Sutro, the Regents fufilled the requirements by CEQA by coordinating at an early stage the exchange and evaluation of information between project planners and environmental consultants and eliciting and considering public comments during "this formative stage of planning and review," thereby facilitating the early identification and assessment of significant impacts to "meaningfully influence and effect changes in the proposed projects. . . ." 77 Cal.App.3d at 39.

In contrast, the project activities began well before the environmental review process was completed.[1]

The District began the environmental review process in 10/92 and held a public scoping session held in 11/92. The draft EIR was not circulated until 7/31/93, and a hearing on public comment was not held until 8/23/93. 2 AR 4-48; 6 AR 37; 1 AR 3, 4. The public

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[1] Cf. Stand Tall on Principles v. Shasta Union High School District (1991) 235 Cal.App.3d 772, 781. The court found that selection, as opposed to acquisition, of a project site is not an approval under CEQA because there is no commitment to a defininte course of action. The site was also one of the alternative sites discussed in the EIR. Id.

comment period ended on 9/14/93 and, on 10/25/93, the EIR was certified and the permits were issued. 6 AR 111; 5 AR 1.

Field work began in 2/93 and Chevron received permission to proceed with further field work in 7/93 - prior to the circulation of the draft EIR. By 10/23/93, about 37 % of the field work had been completed and that of 135 pieces of equipment, 69 had been installed on their foundations or in steel structures. A significant portion of the project had been completed even though the EIR had not yet been certified nor were the requisite permits issued. This is clearly more than the beginning of fabrication.

The EIR is intended to analyze the direct and indirect consequences of the project. Public Resources Code § 21083(c); CEQA Guidelines §§ 15064, 15126. For example, the EIR proposed certain mitigation measures regarding traffic impacts of the project, which were rendered somewhat ineffectual by the premature approval of the project and the initiation of construction prior to the certification of the EIR. See 1 AR 160-161, 237-238.

Failure to complete environmental review of the project prior to approval deprives the process of "genuine flexibility." Sundstrom, supra, 202 Cal.App.3d at 307. Timing of the project completion itself indicates that the EIR is a "post hoc rationalization of the agency action." Id. Field activities were begun in 2/93 (8 months before certification of the EIR). As of 10/23/93, the project was 37 % complete. By 2/28/94 (3 months after certification) the project was substantially completed by 2/28/94. Decl. of Brown. The project commenced operation as of 3/9/94 (4 months after certification). Id.

III. Consideration and certification of the EIR.

It is unclear whether or not the EIR was reviewed and considered by the appropriate decision maker.

"[T]he decision-making body or administrative official having final approval authority over a project involving a substantial effect upon the environment [must] review and consider an EIR before taking action to approve or disapprove the project." Kleist v. City of Glendale (1976) 56 Cal.App.3d 770, 778 (citing former CEQA Guidelines § 15085(g), now § 15090). ". . .The requirement exists in part because 'only by this process will the public be able to determine the environmental and economic values of their elected and appointed officials'". Id. at 778 (citations omitted.)

Section 15090 provides that the lead agency is responsible for certifying that the final EIR is completed in compliance with CEQA, and that the decision-making body of the lead agency reviewed and considered the information prior to approving the project.

Section 15090 does not mention delegation of certification duties. Rather, the section gives the lead agency leeway to determine such responsibility. See Comment to CEQA Guidelines § 15090. Nonetheless, the agency may not delegate the review and consideration of a final EIR. CEQA Guidelines § 15025. Such action must be taken by the decision-making body. CEQA Guidelines § 15090.

The "decision-making body" is the person permitted by law to approve or disapprove the project. CEQA Guidelines § 15356. By District Rule, this person is Dr. Lentz, the Executive Officer. As such, it would appear that Dr. Lentz would be the person to review and consider the final EIR. However, the EIR was apparently certified by Barry Wallerstein, Deputy Executive Officer. 5 AR 1. Nowhere in his declaration does Wallerstein inform this court of his authority, delegated or actual, to certify the EIR.

Upon remand, the District should clarify who is to certify the EIR, and who (or what entity) is to review and consider the EIR, as well as who is to adopt the findings, statement of overriding considerations, and the mitigation monitoring plan.

IV. Laches and mootness.

Chevron has failed to demonstrate that the petition is barred by the doctrine of laches and is moot.

"The affirmative defense of laches requires unreasonable delay in bringing suit 'plus either acquiescence in the act about which plaintiff complains or prejudice to the defendant resulting from the delay.'" Miller v. Eisenhower Medical Center (1980) 27 Cal.3d 614, 624 (citing Conti v. Board of Civil Service Commissioners (1969) 1 Cal.3d 351, 359).

"Prejudice is never presumed; rather it must be affirmatively demonstrated by the defendant in order to sustain his burdens of proof and the production of evidence on the issue. [Citation.]" Id.

"Generally speaking, the existence of laches is a question of fact to be determined by the trial court in light of all of the applicable circumstances, and in the absence of manifest injustice or lack of substantial support in the evidence its determination will be sustained. [Citations.]" Id.

Petitioners could not have filed a CEQA challenge until after the posting of the Notice of Determination on 10/26/93. Chevron has stipulated that by 10/23/93, it had already spent $ 13.7 million on the project. This action was timely filed and diligently brought on 11/12/93, well within the statute of limitations.

Furthermore, the court is permitting a contintuation of existing operations pending the remanding of the EIR for proper attention.

Furthermore, the petition is not rendered moot. The petition specifically seeks to set aside the entire project, not just Phase I. The fact that the project is now fully operating has no effect upon the validity of the permits issued.

V. Proper remedy.

The court need not enjoin the underlying activity upon a finding that CEQA has been violated. Public Resources Code § 21168.9. In making this determination, the court must rely upon traditional equitable principles in deciding whether or not the activity should be enjoined. Laurel Heights I 47 Cal.3d at 423.

An injunction would cause substantial economic harm to Chevron and would adversely affect consumers, as well as the District's obligations under the Clearn Air Act. Decl. of Brown.

Note: Thank you to all counsel. All of the briefs were clear, concise and informative.

PROOF OF SERVICE

STATE OF CALIFORNIA, COUNTY OF ORANGE

At the time of service, I was over 18 years of age and not a party to this action. I am employed in the County of Orange, State of California. My business address is 4695 MacArthur Court, Suite 1100, Newport Beach, CA 92660.

On January 29, 2015, I served true copies of the following document(s) described as **PROJECT PROPONENT PHILLIPS 66 COMPANY's OPPOSITION TO APPEAL OF APPROVAL AND CERTIFICATION OF THE FINAL NEGATIVE DECLARATION FOR THE PHILLIPS 66 CARSON CRUDE OIL STORAGE CAPACITY PROJECT FILED BY COMMUNITIES FOR A BETTER ENVIRONMENT** on the interested parties in this action as follows:

Kurt Wiese, Esq.
General Counsel
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, 91765
Email: **kwiese@aqmd.gov**

Yana Garcia, Esq.
Staff Attorney
Communities for a Better Environment
1904 Franklin, Suite 600
Oakland, CA 94612
Email: **ygarcia@cbecal.org**

BY E-MAIL OR ELECTRONIC TRANSMISSION: I caused a copy of the document(s) to be sent from e-mail address janis.lucian@clydeco.us to the persons at the e-mail addresses listed in the Service List. The document(s) were transmitted at or before 5:00 p.m. I did not receive, within a reasonable time after the transmission, any electronic message or other indication that the transmission was unsuccessful.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on January 29, 2015, at Newport Beach, California.



Janis A. Lucian

Suma Peesapati (CA Bar No. 203701)
Michael Robinson-Dorn (CA Bar No. 159507)
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Counsel for Petitioner Communities for a Better Environment

SOUTH COAST AQMD
CLERK OF THE BOARDS

'15 JAN 28 A6 :49

BEFORE THE GOVERNING BOARD OF THE

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

In the Matter of SCAQMD'S NEGATIVE DECLARATION AND NOTICE OF DETERMINATION ON PHILLIPS' 66 CARSON CRUDE OIL STORAGE CAPACITY PROJECT	PETITION TO SET HEARING DATE FOR APPEAL OF FINAL NEGATIVE DECLARATION FOR THE PHILLIPS 66 CARSON CRUDE OIL STORAGE CAPACITY PROJECT

TO THE CLERK OF THE DISTRICT BOARD:

Communities for a Better Environment ("CBE") hereby requests a hearing in order to appeal the District's December 12, 2014 decision to adopt a Negative Declaration for the Phillips 66 Carson Crude Oil Storage Capacity Project ("Project") under the California Environmental Quality Act

("CEQA"). Pursuant to Rule 1201, this Petition is being filed within ten days of the next Board meeting scheduled for February 6, 2015. For the following reasons, CBE respectfully requests a hearing before the Governing Board on its pending appeal on February 6, 2014, or as soon thereafter as possible.

I. INTRODUCTION

On December 12, 2014, in violation of CEQA's public disclosure mandate, Air District staff quietly approved one piece of a massive expansion of Phillips 66's Carson refinery plant—one of California's largest refineries—on a Negative Declaration, CEQA's minimal level of environmental review. The Project not only increases the refinery's total throughput, but also increases quantities of dirtier, unconventional crudes, such as highly viscous and sulfur-laden Canadian tar sands and explosive, fracked crude from the Bakken shale. Each stage of the cycle of extracting, transporting and refining these dirty crudes creates significant impacts. For example, on July 6, 2013, a train carrying Bakken crude oil exploded, killing forty-seven individuals and destroying nearly half the town of Lac-Mégantic, Quebec.[1] Sadly, that accident became the first in a series of well-publicized derailments and explosions throughout the continent.

The location of the Project also raises important environmental justice concerns in an area already over-burdened with industrial air pollution—an area shown to suffer from, among other health concerns, an increased prevalence of respiratory ailments. Of particular note, the City of Carson, where Phillips 66's refinery would be expanded, contains several schools. A growing body of scientific studies indicate that toxic emissions have a particularly detrimental effect on developing lungs.

[1] Nicholas Keung, *Lac-Mégantic train victims reach $200M settlement*, THE STAR (Jan. 9, 2015), http://www.thestar.com/news/canada/2015/01/09/200m_settlement_reached_in_lacmgantic_rail_disaster.html.

The Project's increased emissions frustrate the region's long-delinquent attainment of the Clean Air Act's national health-based air quality standards and the Global Warming Solutions Act of 2006, which requires the state to reduce its greenhouse emission levels to 1990 levels by the year 2020. Cal. Health & Safety Code § 38500 *et. seq.* For these reasons, as further discussed below, and the many other reasons detailed in its appeal (attached hereto), CBE petitions the Board to promptly hear its appeal of staff's Negative Declaration.

II. FACTUAL BACKGROUND

CBE, and particularly its members who live in the South Coast Air District, suffer the ill effects of refinery operations, associated accidents, flares, and toxic emissions. CBE's members are on the front lines of industrial pollution and experience public health outcomes that are consistent with high levels of such exposures. These front-line communities score among the state's highest Toxic Release Inventory chemical burdens, and as a result of which experience heightened frequencies of asthma, other respiratory disorders, low birth weight in infants, and other health issues.[2] In light of these alarmingly high levels of background pollution, CBE's members are deeply concerned about the oil industry's recent trend towards increased transport, storage, and refining of dirtier crude oils, and Phillips 66's stated desire to follow that trend at its Carson facility.

In 2013, when the District initiated a public review and comment period for a Draft Negative Declaration regarding the Project, CBE submitted extensive legal and technical comments supporting a full Environmental Impact Report ("EIR"). The Draft Negative Declaration inaccurately characterized the Project as solely intended to increase storage capacity at the refinery. As explained by CBE's attached appeal, the project description failed to include the full scope of the project, which

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[2] OEHHA Cal Enviro Screen 1.1 (amended), Statewide Zip code Result, data available at: http://oehha.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=1d202d7d9dc84120ba5aac97f8b39c56, zip code results for 90745 (Carson) and 90744 (Wilmington); see also, results for zip codes 90220, 90211 (Compton), last accessed on January 24, 2015.

would modify the refinery to significantly increase the facility's crude throughput, including increased refining of tar sands and Bakken crude. Despite the substantial evidence to the contrary, the Draft Negative Declaration concluded that the Project would have no significant impacts on the environment and that therefore no EIR was required. The District's public comment period on the Draft Negative Declaration spanned thirty days, ending on October 9, 2013.

Prior to the close of the comment period, CBE submitted several comments noting the substantial flaws and omissions in the Draft Negative Declaration, including: (1) the Project description failed to disclose the scope of use of "advantaged" or "cost-advantaged" crudes, supported by Phillips 66 corporate data evidence; (2) substantial scientific evidence indicating the corrosive, high-sulfur content advantaged oils would increase air emissions and other hazards; and (3) the considerable existing burden in the area surrounding the refinery, which would be exacerbated by the Project.

Since October 2013, CBE, other environmental organizations, and technical experts have submitted extensive comments on other similar projects initiated by Phillips 66 and other petroleum companies utilizing unconventional crude oils, showing that such projects yield highly dangerous fugitive and operational emissions stemming from both process and storage equipment.

On December 22, 2014, CBE received notice that the District issued its Notice of Determination and certified a Final Negative Declaration on December 12, 2014. Other than the listing of the Governing Board members' names on the Final Negative Declaration, there is no evidence that the Governing Board reviewed the Draft Negative Declaration.

On January 2, 2014, CBE sent a letter to South Coast Air Quality Management District staff citing the above-described procedural and substantive defects, and requesting withdrawal of the Final Negative Declaration. After hearing no response from the District staff, CBE filed an appeal with the

Governing Board. To date, Governing Board has failed to acknowledge or respond to CBE's appeal. CBE now requests, pursuant to Rule 1201, that the Governing Board hear CBE's appeal of the disputed Negative Declaration on February 6, 2015, or as soon thereafter as possible.

III. GROUNDS FOR APPEAL

CBE petitions the Governing Board to hear its appeal of the Phillips 66 Carson Crude Oil Storage Capacity Project ("Project") Final Negative Declaration for three main reasons. First, District staff does not have authority under CEQA to approve and certify a final negative declaration. Second, the Project description is inaccurate and artificially constrained. The Project would result in a massive retooling of the refinery, including an increase in throughput, not merely an increase in storage capacity as claimed by Phillips and the District.

Third, the District violated CEQA's mandate that an EIR be prepared when, as in this case, commenters have presented substantial evidence supporting a "fair argument" that the Project may cause significant adverse health and environmental impacts.[3][4] A negative declaration is appropriate only when there is no substantial evidence that the project may have a significant environmental impact.[5] Substantial evidence includes "facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts."[6] An EIR is necessary to resolve "uncertainty created by conflicting assertions" and to "substitute some degree of factual certainty for tentative opinion and speculation."[7] An agency's "decision not to require an EIR can be upheld only when there is *no credible evidence* to the contrary."[8]

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[3] CEQA Guidelines §15162.
[4] Pub. Res. Code §§21002.1(a), 21061.
[5] Pub. Res. Code § 21080(c)(1).
[6] Cal. Code Regs. tit. 14, § 15384.
[7] *No Oil, Inc. v. City of Los Angeles*, 13 Cal.3d 68, 77 (1975) (*quoting County of Inyo v. Yorty*, 32 Cal.App.3d 795, 814 (3d Dist. 1973)).
[8] *Sierra Club v. County of Sonoma* (1992) 6 Cal.App.4th 1307, 1318 (emphasis added).

CBE provided substantial evidence throughout its comments, and presented additional evidence after the close of the comment period in an appeal letter to the Governing Board, demonstrating that the Project is likely to have significant adverse impacts on the environment. That included evidence that the Project will increase the quantity of dangerous crudes transported, stored, and processed at the Los Angeles Refinery. Although the District conceded in response to comments that Phillips 66 has been processing unconventional crudes for some time without disclosure to the public the refinery has been refining relatively low percentages of Canadian tar sands and Bakken crudes until now. The District failed to analyze the potential environmental, health, and safety impacts from increased use of these crude types. Because the Project would enable Phillips 66 to bring in substantially greater amounts of heavy tar sands and volatile Bakken crudes, this analysis is crucial to determining the true environmental impacts of the Project.

Phillips 66's intent to increase the amount of Canadian tar sands and Bakken crudes is evidenced by the project's increased tank storage volume and throughput, Phillips 66's 2012 Summary Annual Report included in CBE's comments on the Draft Negative Declaration, emails sent to the District from Phillips 66 representatives directly stating that the crude tank application was to accommodate Access Western Blend ("AWB") Canadian crude, public statements made by Phillips 66 representatives and a transcript of an investor conference call from the third quarter of 2014 indicating that the company intends to get to "100% advantaged crude in the next year."[9] CBE's comments also include quotes from Phillips 66 representatives stating that the company specifically intends to increase shipments of tar sands and Bakken crudes as "advantaged crudes."

While the Negative Declaration assumes that the project's increased tank storage is only for the purpose of offloading from ships faster and optimizing blending, the companies own statements present a contrary indication. The District failed to evaluate the potential environmental impact of the

increase in the amount of these dangerous crudes being transported, stored, and refined at Phillips 66's Refinery.[10] The District also failed to evaluate the potential for a significant increase of sulfur content in the crude, as compared to the baseline, due to the project.

CBE has presented ample evidence in its comments and its appeal letter to the Governing Board to constitute substantial evidence that the Project may have significant adverse environmental, safety, and health impacts. The District failed to consider the differences in Canadian tar sands and Bakken crudes in terms of sulfur content, reactive organic compounds (ROG), and Toxic Air Contaminants (TAC). It is well known, and further documented by evidence provided by CBE in its comments and attached appeal, that heavy, high-sulfur Canadian crudes carry serious environmental and human health implications. Increases in the sulfur content of the crude processed means that the refinery will have to engage in more sulfur processing, which can lead to higher emissions of hydrogen sulfide,[11] increased danger of corrosion, and increased accident risks. CBE identified all of these impacts in comments on the Draft Negative Declaration. Ignoring CBE's substantial evidence to the contrary, the Final Negative Declaration continued to incorrectly state that "[t]he Draft ND does not include a baseline or future changes in crude oil type refined by the LARC because the proposed project will not change, enlarge, or otherwise impact the types and/or quantities of crude oil that LARC currently does and will continue to refine."[12] In its response, the District further missed

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[9] Q3 2014 Transcript at p. 6, attached hereto in the appeal document exhibits.

[10] Pub. Res. Code § 15162(a)(3) (requiring an agency to prepare an EIR where new information of substantial importance shows the project will have significant impacts not discussed in a previous Negative Declaration or more severe impacts than previously discussed).

[11] A study by the Norwegian University of Science and Technology explains, "The sulfur compounds in crude oils and natural gas generally exist in the form of free sulfur, hydrogen sulfide, thiols, sulfides, disulfides, and thiophenes. These compounds can cause considerable technical, environmental, economic, and safety challenges in all segments of petroleum industry, from upstream, through midstream to downstream. . . . The major corrosion problems in oil and gas processing facilities are not caused by hydrocarbons but by various inorganic compounds, such as water, hydrogen sulfide, hydrofluoric acid, and caustic. There are two essential sources of these conglomerates: feed-stock contaminants and process chemicals, including solvents, neutralizers, and catalysts (Nenry & Scott, 1994)." Production and processing of sour crude and natural gas - challenges due to increasing stringent regulations, Norwegian University of Science and Technology, 2013, http://www.diva-portal.org/smash/get/diva2:649648/FULLTEXT01.pdf

[12] Final ND at p. F-62.

the mark by pointing to crude oil volume limits at the distillation unit. These volume limits do not limit the percent of sulfur in the crude. An analysis of the Project's potential impact on the baseline sulfur content remains critical to understanding the Project's environmental impacts.

Certain cost advantaged crudes, such as Bakken crude, also differ in vapor pressure and flammability, which determine the levels of ROGs and TACs.[13] The levels of ROGs and TACs fluctuate independent of sulfur content and will result in significant impacts not considered by the District. CBE provided an expert report from Dr. Phyllis Fox submitted for the purpose of analyzing impacts from similar projects elsewhere in the state, which detail the significant, detrimental impacts that result from the chemical composition diluents used to blend \with this type of crude.[14] These potential impacts include: increases in ROG that contribute to existing violations of ozone ambient air quality standards; increases in TAC emissions that significantly increase health risks to already over-burdened local communities; increases in malodorous sulfur compounds that result in significant odor impacts; increases in combustion emissions that contribute to existing violations of ambient air quality standards; and increases in flammability that increase the potential for more dangerous accidents involving storage and process equipment.[15] In addition, the Department of Transportation has published safety alerts for all forms of transport of Bakken crude oil because the volatility of this crude increases the danger of transporting it by ship, rail, or any other means.[16] The Final Negative Declaration failed to address any of these potentially significant impacts from the Project's intended increase in Canadian tar sands and North Dakotan Bakken crude oils. For all the reasons stated above, and in CBE's comments and attached appeal, Air District staff issued the Final Negative Declaration in error. That document, and the associated project approvals, must be withdrawn

[13] *See* Appeal Document Exhibit U (Dr. Fox report to Valero Crude By Rail Project EIR – Benicia).
[14] *Id.*
[15] *Id.*

pending the District's preparation of a full EIR that discloses, analyzes and mitigates the significant impacts resulting from the increased transport, storage, and refining of dirty and dangerous crudes in Phillips 66's crude slate.

IV. THE DISTRICT HAS NO PROCESS FOR APPEALING A STAFF'S DECISION ON A NEGATIVE DECLARATION

The District lacks any procedure for appealing staff decisions on CEQA determinations for projects where the District is the lead agency. CBE sent the Governing Board a formal appeal letter on January 9, 2015, but received no response to the letter or any indication that the Governing Board considered the letter. In addition, the Final Negative Declaration included no procedures for appeal. California law provides that when non-elected officials adopt a Negative Declaration, the adoption may be appealed to "the agency's elected decisionmaking body."[17] As the agency's elected decisionmaking body, the Governing Board, must provide a mechanism for appealing Negative Declarations.

V. REQUEST FOR HEARING

CBE is appealing staff's decision to the Governing Board because: (1) the District failed to prepare an EIR for this project despite the substantial evidence supporting a fair argument that the project will have significant impacts on the environment; (2) District staff lacks authority under CEQA to approve and certify a final negative declaration; and (3) the District lacks a process for appealing negative declarations to its elected governing body, all in violation of CEQA. For these

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[16] The U.S. Department of Transportation Pipeline and Hazardous Material Safety Administration, January 2, 2014, http://phmsa.dot.gov/pv_obj_cache/pv_obj_id_111F295A99DD05D9B698AE8968F7C1742DC70000/filename/1_2_14%20Rail_Safety_Alert.pdf.

[17] Cal. Code Regs. tit. 14, § 15074 (providing that provides that "[w]hen a non-elected official or decisionmaking body of a local lead agency adopts a negative declaration or mitigated negative declaration, that adoption may be appealed to the agency's elected decisionmaking body, if one exists."); Cal. Pub. Res. Code § 21151 (providing that "[i]f a nonelected decisionmaking body of a local lead agency certifies an environmental impact report, approves a negative declaration or mitigated negative declaration, or determines that a project is not subject to this division, that certification, approval, or determination may be appealed to the agency's elected decisionmaking body, if any.").

reasons, CBE requests that Governing Board reject the staff's Negative Declaration and rescind all related Project approvals pending preparation of a full EIR that discloses, analyzes, and mitigates the Project's significant and adverse environmental impacts.

Accordingly, CBE respectfully requests a hearing on its appeal during the Board's next scheduled meeting date of February 6, 2015, or as soon thereafter as possible.

DATED: January 27, 2015

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CERTIFICATE OF SERVICE

STATE OF CALIFORNIA, COUNTY OF ORANGE

I, Debi Gloria, declare that I am and was at the times of the service hereunder mentioned, over the age of (18) eighteen years, and not a party to the within cause. My business address is: UC Irvine School of Law, 401 East Peltason, Suite 1000, Irvine, California 92697.

On January 27, 2015, I caused to be served the below listed document(s) entitled:

PETITION TO SET HEARING DATE FOR APPEAL OF FINAL NEGATIVE DECLARATION FOR THE PHILLIPS 66 CARSON CRUDE OIL STORAGE CAPACITY PROJECT

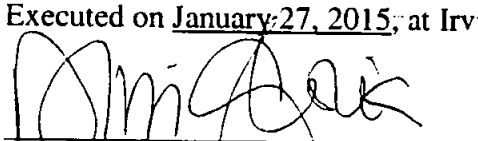
To be sent to:

Clerk of the District Board
21865 E. Copley Drive
Diamond Bar, California 91765

[X] By Personal Service via Courier:
I personally dispatched the documents to a bonded courier service to have them delivered to the persons at the addresses listed in item 5. Delivery was made to the party or by leaving the documents at the party's office with some person not younger than 18 years of age between the hours of eight in the morning and six in the evening.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on January 27, 2015, at Irvine, California.



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BEFORE THE GOVERNING BOARD OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

In the Matter of **The South Coast Air Quality Management District's December 12, 2014 Approval and Certification of the Final Negative Declaration for the Phillips 66 Carson Crude Oil Storage Capacity Project**	**APPEAL OF APPROVAL AND CERTIFICATION OF THE FINAL NEGATVIE DECLARATION FOR THE PHILLIPS 66 CARSON CRUDE OIL STORAGE CAPACITY PROJECT**

I. INTRODUCTION

This appeal challenges the South Coast Air Quality Management District's ("District") failure to comply with the California Environmental Quality Act ("CEQA"), Public Resources Code § 21000 *et. seq.*, 14 Cal.Code Regs § 15000 *et. seq.* in its approval and certification of the Final Negative Declaration for the Phillips 66 Carson Crude Oil Storage Capacity Project ("Project") on December 12, 2014. The District's approval of a Final Negative Declaration for the Project fails to comply with CEQA because there is substantial evidence in the administrative record of a fair argument that the Project may have a significant, adverse effect

on the environment and human health; thereby requiring preparation of an environmental impact report ("EIR").[1]

Because the District Governing Board is the governing body of the agency, the Governing Board has a non-delegable duty under CEQA to certify a Final Negative Declaration.[2] The Governing Board has no published, formal procedures for evaluating and deciding on CEQA documents. Additionally, the Final Negative Declaration approved and certified on December 12, 2014 appears to have been considered, approved and certified solely by District staff. This process makes the District's decision to approve and certify the Final Negative Declaration unclear, and renders the approval and certification procedurally deficient.

Moreover, because the District is also the highest-elected decision-making body for the agency, CEQA requires that the Governing Board provide for an appeal of the District staff's CEQA determination.[3] Accordingly, Communities for a Better Environment ("CBE") hereby requests that the Governing Board deny certification, withdraw and re-consider the District's approval of the Final Negative Declaration for the Project in accordance with its non-delegable authority under CEQA Guidelines, §15025(b)(1), or, in the alternative, appeals the District's approval and certification of the same Final Negative Declaration pursuant to the same CEQA Guidelines section.

II. FACTUAL BACKGROUND

CBE, and its members, particularly those who reside in and around refineries located in the South Coast Air District, have long expressed their concern with refinery operations, their emissions, and potential hazards including flares and accidents that result from refinery operations. Since at least the year 2013, CBE, CBE members and allies have expressed serious concerns with industry trends to increase the transport, storage and refining of dangerous crudes from new North American, domestic and Canadian sources. These concerns have been noted in

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[1] *See* CEQA Guidelines, 14 Cal. Code Regs § 15064 (f)(1) ("if a lead agency is presented with a fair argument that a project may have a significant effect on the environment, the lead agency *shall* prepare an EIR even though it may also be presented with other substantial evidence that the project will not have a significant effect." (emphasis added).

[2] CEQA Guidelines, §15025(b)(1).

[3] Cal. Health and Safety Code § 40420; CEQA Guidelines §15025(b)(1) (requiring the decision-making body to approve a negative declaration prior to approving a project); *c.f. Id.* § 15074(f) (providing for appeal of a decision by a local lead agency to adopt a Negative Declaration to the agency's highest elected decision-making body).

correspondence to the District attached hereto at Exhibit A, and have formed the basis for comments submitted to District Staff in relation to project proposals and permit approval processes including the environmental review process for the Phillips 66 Carson Project, as well as other Phillips 66 project proposals throughout the state.

On or about September 6, 2013, the District issued for public review and comment a Draft Initial Study and Negative Declaration for the Project pursuant to Public Resources Code section 21092.

The Project description contained in the Draft Negative Declaration described the project as one involving the following components: (1) installation of one new 615,000 bbl nominal capacity crude oil storage tank, which is identified as tank 2640, and which would be accompanied by a geodesic dome for fugitive emission controls; (2) increasing the permitted throughput limit of two 320,000 bbl nominal capacity existing external floating roof crude oil storage tanks, Tanks 510 and 511, from 4.562 million bbl per year to 18 million bbl per year for each tank and installing geodesic domes on each of those tanks to control fugitive emissions; (3) installation of two new, 2,100 gallons per minute (gpm) crude oil feed/transfer pumps to transfer crude oil into and out of the new tank (Tank 2640); (4) installing of one new, 14,000 bbl nominal capacity water draw surge tank (Tank 2643), including geodesic dome, pumps, and pipelines; (5) installation of three new heat exchangers and one steam trap to assist in water treatment; (6) installation of tie-ins to the manifold of the Pier "T" crude oil delivery pipeline from Berth 121; and (7) installation of one new electrical power substation.

The Draft Negative Declaration and Notice of Intent concluded that the Project components described above would not have a significant impact on the environment and therefore, no EIR would be required for the Project.

SCAQMD invited comments on the Draft Negative Declaration for a period of 30 days, and closed the comment period on October 9, 2013.

On October 9, 2013, prior to the close of the comment period, CBE submitted comments, based on, *inter alia*, the following flaws in the Draft Negative Declaration's analyses:

1. CBE asserted in comments that the Project description was piecemealed from a larger,

company-wide project to front-end the transport, storage and refining of "advantaged" or "cost advantaged" Western Canadian tar sands, and North Dakota Bakken crudes. In support, CBE included Phillips 66 corporate and market data indicating that Phillips 66 considers "advantaged" or "cost advantaged" crudes to be comprised of Western Canadian tar sands and North Dakota Bakken crudes, and that based on a variety of publicly available data, the company intended to increase shipments of such crudes specifically to its Los Angeles refinery, including the Carson facility,

2. CBE also identified project specifications further indicating that the Project was designed to facilitate the Los Angeles Refinery's receipt, storage and processing of "advantaged" crudes;
3. CBE pointed to substantial evidence, including reports, data and other scientific information showing why such new crude would cause significant environmental impacts including but not limited to, increased air emissions and risks of hazards as a result of sulfur corrosion from higher-sulfur content crudes; and
4. CBE highlighted the cumulatively considerable, existing burden in the area surrounding the project, specifically in the City of Carson, and in Wilmington.

In January 2014 CBE members and staff met with District staff and members of the Governing Board about another project, and asked for updates and information about the Phillips 66 Carson Project. CBE staff and members specifically asked the District to consider the health and hazards impacts that could result from increasing the amount of tar sands and Bakken crudes blended in Los Angeles refinery crude slates, noting the Phillips 66 Los Angeles refinery in particular. Between February and November 2014 CBE staff and members made additional, repeated requests for information regarding the Project from District staff and some members of the Governing Board, both individually and during public comment at regular Governing Board meetings, and for information specifically regarding the air emissions and health impacts of transporting, receiving and refining tar sands and Bakken crudes.

Since October 2013, CBE and other environmental health and justice organizations have submitted extensive comments on other projects proposed by Phillips 66 in Santa Maria, San

Luis Obispo County, and in Rodeo, Contra Costa County, as well as other non-Phillips 66 projects to transport, store and refine tar sands and Bakken crudes. In these comments, CBE, and other allied environmental health and justice organizations, advocates and technical experts, have exposed new information regarding the potential for highly dangerous fugitive and operation emissions from both process and storage equipment, and the increased risks of potentially catastrophic hazards associated with such crudes.

A relevant selection of these comments and other relevant documents are attached hereto in Exhibits.

On December 12, 2014, after over a year of reviewing and responding comments District staff published its Notice of Determination and Project approval, finalizing and certifying the same Draft Negative Declaration released on September 6, 2013 for comment, as the Final Negative Declaration for the Project.

On December 22, 2014, CBE staff received by mail, the District's notice of determination, project approval and approval of the final negative declaration. The Notice and Project approval documents indicate that the Final Negative Declaration was certified on the same day the District issued its Notice of Determination: December 12, 2014.

Despite the names of all Governing Board members being listed on the second page of the final negative declaration, the Governing Board has not approved the project and the final negative declaration for the Project is not reflected in any publicly available SCAQMD Board meeting agendas or minutes documents.[4] Thus, while the notice received by CBE indicates that the final negative declaration was certified, there is nothing contained on the record to indicate that it was considered by the Governing Board. In fact, the list of all Governing Board members affirmatively misleads the public that the Governing Board has reviewed the document, when it

[4] The only reference to the Governing Board's consideration of the Draft or Final Negative Declarations for the Project that appear to be publicly available, is found in the Governing Board Agenda packet for the December 5, 2014 regular Governing Board meeting. That agenda, and "Attachment C" to the agenda, are attached hereto at Exhibit (X). The attachment indicates only that the Governing Board reviewed a summary of the active projects for which the District is the lead agency wherein the Draft Negative Declaration for the Project was included. District's Staff's description of that status of the Draft Negative Declaration at the time of the Board meeting provides only that the Staff's consultant "is making edits to the responses and finalizing the Draft ND." (*See* Final Negative Declaration, Appendix F: Phillips 66 Los Angeles Refinery – Carson Plant Crude Oil Storage Capacity Project.)

has not.

In response to the comments submitted by CBE on October 9, 2013, District staff claim the following, *inter alia*: (1) CBE's characterization of project specifications indicating that the Project may be designed to facilitate the increased transport, storage and processing of tar sands or Bakken crudes is mistaken as CBE misunderstands the refinery's operations, and the purpose of the Project is merely to increase efficiency and capacity to offload and store larger crude tank deliveries made by marine vessel to the Los Angles Refinery; (2) that CBE's characterization of any increased emissions and/or significant environmental impacts including cumulative impacts is similarly misguided as CBE misunderstands the purpose of the Project; and (3) that the Phillips 66 Los Angeles Refinery has already been receiving, storing and processing Canadian crudes including tar sands crudes and tar sands crude blends since 2002, and the District has included in its response to Comments, new information to support this claim, which was not previously released or made publicly available at any time during the comment period.[5]

The District's revealing of new information at the same time in which its staff has rubber stamped a cursory environmental review document, itself requires immediate withdrawal of the District's approval of the Final Negative Declaration for the Project, and requires reconsideration of the appropriateness of a negative declaration under the circumstances. In particular, the Final Negative Declaration fails to analyze the current and post-project crude quality baseline, as required by CEQA.

In public statements made by Phillips 66 representatives and through the environmental review process for its two additional projects proposed in San Luis Obispo and Contra Costa County, Phillips 66 continues to expose additional information regarding its plans, and its execution of its plans to transport, process and refine tar sands and Bakken crudes at all of the company's California refineries. For example, in a transcript from an investor conference call from the third quarter of 2014, Phillips 66 Chairman and CEO is quoted stating that the company will "get **to 100% advantaged crude in the next year**" or so as we continue to move these

[5] *See generally*, Final Negative Declaration, Appendix F: Phillips 66 Los Angeles Refinery – Carson Plant Crude Oil Storage Capacity Project; and at F-46.

projects forward around infrastructure.[6] Such statements and information find further support in Project applications and related application documents including correspondence between District staff and Phillips 66 representatives, attached hereto in exhibits. All of these facts require the District to immediately withdraw the its approval of the Final Negative Declaration, as the document still fails to account for the impacts that stem from Phillips 66's change in crude slate, as further described below.

On January 2, 2014 CBE sent a letter to SCAQMD staff requesting withdrawal of its approval of the final negative declaration as a result of notice issues, some of the issues raised above, in comments, and in the District's responses to comments. After hearing no response from District staff, CBE hereby files this appeal to the Governing Board.

III. GROUNDS FOR APPEAL

CBE appeals the District's approval of the Project's Final Negative Declaration for two reasons. First, District staff does not have authority under CEQA to approve and certify a Final Negative Declaration on its own. Approving final negative declarations is a non-delegable duty of the District Governing Board.[7] Second, the District violated CEQA's mandate that an EIR be prepared when, as in this case, commenters have met the "fair argument" legal standard by presenting substantial evidence that the Project may cause significant adverse health and environmental impacts and when new, material information regarding the project has become available since the close of the comment period.[8] As such, and for the additional reasons briefly herein, and supported by the attached Exhibits we appeal the District's December 12, 2014 final determination approving and certifying the Phillips 66 Carson Project Final Negative Declaration.

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[6] Q3 2014 Transcript at p. 14, attached hereto in exhibits (emphasis added).
[7] *CEQA Guidelines, §15025(b)(1).*
[8] CEQA Guidelines §15162.

THE DISTRICT MUST PREPARE AN EIR FOR THIS PROJECT

1. CEQA provides a low threshold for when an agency must prepare an EIR.

CEQA must be interpreted to "afford the fullest possible protection to the environment within the reasonable scope of the statutory language."[9] CEQA requires a lead agency to assess a project's impacts on the environment.[10] Preparation of an EIR is required whenever substantial evidence in the record supports a *fair argument* that significant impacts may occur.[11] The "fair argument" standard creates a low threshold for requiring preparation of an EIR.[12]

Because issuing a Negative Declaration has a terminal effect on the environmental review process, CEQA provides that a lead agency may only issue a Negative Declaration instead of a full EIR if there is "no substantial evidence, in light of the whole record before the lead agency, that the project may have a significant effect on the environment."[13] An EIR is necessary to resolve "uncertainty created by conflicting assertions" and to "substitute some degree of factual certainty for tentative opinion and speculation."[14] An agency's decision not to require an EIR can be upheld only when there is *no credible evidence* to the contrary.[15]

2. The District's decision to approve and certify the Negative Declaration ignores potentially significant impacts from allowing for the increased transport, storage and processing of dangerous domestic and Canadian derived crudes—which the District admits for the first time in responses to comments have been processed in the past at the Lost Angeles Refinery.

CBE cited throughout its comments evidence that the project is likely to have significant impacts on the environment, especially given the fact that the refinery intends to increase the

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[9] *Communities for a Better Environment v. Calif. Resources Agency* (2002) 103 Cal. App. 4th 98, 110.
[10] Pub. Res. Code §§ 21002.1(a), 21061.
[11] *Ocean View Estates Homeowners Ass'n v. Montecito Water Dist.* (2004) 116 Cal.App.4th 396, 399; Pub. Res. Code § 21080(d); CEQA Guidelines § 15384(a) ("'Substantial evidence' as used in these guidelines means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached.").
[12] *Ocean View Estates*, 116 Cal.App.4th at 399; *Citizens Action to Serve Students v. Thornley* (1990) 222 Cal.App.3d 748, 754.
[13] Pub. Res. Code § 21080(c)(1).
[14] *No Oil, Inc. v. City of Los Angeles* (1975) 13 Cal.3d 68, 77, quoting *County of Inyo v. Yorty* (3d Dist. 1973) 32 Cal.App.3d 795, 814.
[15] *Sierra Club v. County of Sonoma* (1992) 6 Cal.App.4th 1307, 1318 (emphasis added).

amount of dangerous and dirty domestic crudes, and that this Project will necessarily involve offloading, storage and refining of such crudes at the Los Angeles Refinery. The District's responses to comments concerning the Phillips 66 Carson Project expose the agency's cavalier approach to the serious human health and environmental concerns raised by commenters to that project, as well as other, similar projects. In its responses, the District--for the first time--admits the refinery has been using relatively low percentages of Canadian crude, with Table F-1 showing overall Canadian crude at 9.5% over the years, with the highest percent at 21% in 2013[16] so the refinery has the potential to greatly increase use of this crude oil source.[17] The District states that Phillips 66 not only plans to bring down heavy tar sands and dangerous Bakken crudes in the foreseeable future, but it also concedes that the refinery has been processing the same crude types, without disclosure to the public for a significant amount of time.[18]

Publicly exposing this fact in the same act in which it rubber stamps its minimal review of the Project's potential impacts presents a clear dereliction of the agency's duty to protect the environment and to minimize air emissions in the South Coast.[19] Furthermore, because the District revealed this critical new information for the first time in its responses to comments, it must analyze the resulting impacts.[20] The impacts resulting from the increased transport, storage, and refining of dirty and dangerous crudes in Phillips 66's crude slate must be analyzed in an EIR.

The new information contained in the District's responses to comments also requires

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[16] *See e.g.*, Notice of Determination – Final Negative Declaration Phillips 66, Los Angeles Refinery – Carson Plant Crude Oil Storage Capacity Project – SCH No. 2013091029, at Appendix F, Response 2-9, F-46.

[17] ND Appendix F, p. F-46.

[18] *See e.g., Id.* at F-42.

[19] *See City of Redlands v. County of San Bernardino* (2002) 96 Cal.App.4th 398, 405 (holding that an (EIR) must be prepared under CEQA whenever substantial evidence in the record supports a "fair argument that a proposed project will have a significant effect on the environment" (citations omitted).); *see also*, CEQA Guidelines §15384, and 42 U.S.C. § 7401(b)(1)-(3), (c), *supra*; *and see* Cal. Health and Safety Code § 40001(b) (District rules and regulations may, and at the request of the state board provide for the prevention and abatement of air pollution episodes which, at intervals, cause discomfort or health risks to, or damage to the property of, a significant number of persons or class of persons.).

[20] Pub. Res. Code § 15162(a)(3) (requiring an agency to prepare an EIR where new information of substantial importance shows the project will have significant impacts not discussed in a previous Negative Declaration or more severe impacts than previously discussed).

withdrawal of approval and reconsideration of the Final Negative Declaration for the Project, and requires preparation of an EIR. The District's responses to comments, specifically conceding that Phillips 66 already processes and refines Canadian crude blends including tar sands crudes and as well as domestic Bakken crudes substantiate a fair argument that the Project may cause significant environmental impacts. Moreover, this new information, coupled with Phillips 66's more recent Corporate statements cited above further indicate that there are substantial changes to the circumstances under which the Project is being undertaken, requiring a new environmental review process.[21]

2. *The District cannot ignore substantial evidence weighing in favor of preparing an EIR.*

Phillips 66's own stated project objectives substantiate at least a fair argument that the Project may cause significant adverse environmental impacts that were not addressed by the District in the environmental review process for the Final Negative Declaration. For example, the District has failed to analyze the potential significant increase in baseline sulfur content in the refinery due to a change in the *average* crude oil slate toward substantially increased Canadian tar sands crude oil, facilitated by the new and expanded storage tanks.[22] The Final Negative Declaration assumes that the project's increased tank storage volume and throughput is only for the purpose of offloading from ships faster and to optimize blending.[23] The District asserts that this is unrelated to and cannot cause any downstream changes in the refinery, and it appears that the District's exposure of the fact that the refinery already processes both Canadian and domestic Bakken crudes is included in responses to comments in order to support this claim.[24]

The District's conclusion, however, is incorrect, and fails to adequately address CBE's comments concerning the impacts resulting from a shift in the quality of crude received and

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[21] *See* CEQA Guidelines § 15162 (requiring preparation of subsequent environmental review documents when there are changes in circumstances surrounding a project proposal, notwithstanding approval or certification of the initial environmental review document.

[22] For the purpose of this appeal, this point is made, notwithstanding the District's claim that there will be no increased to the Refinery's throughput levels.

[23] See Final Negative Declaration at pp. 1-3 and 1-5 to 1-6.

[24] Final Negative Declaration Appendix F, at pp. F-42.

stored at the Carson facility.

The record shows that both the District and Phillips 66 are clear that the Project storage tanks will be used for the express purpose of bringing in larger volumes of "advantaged" crude oil from Canada and the Bakken shale, implying a change in the overall crude slate quality by volume, notwithstanding the fact that the Refinery may process some inherently lower volumes of Canadian and Bakken crudes currently and may have in the past. Phillips 66's 2012 Summary Annual Report included in CBE's comments on the Draft Negative Declaration provides a map showing the company's plans to bring increased shipments of what it calls "advantaged crudes" to the LA Refinery, specifically from Canada and from the North Dakota Bakken fields. CBE's comments also quote Phillips 66 representatives stating that the company specifically intends to increase shipments of tar sands and Bakken crudes as "advantaged crudes." There is also more in our comments on the draft ND showing where the company stated its intention to bring these "advantaged crudes" to California. Phillip's Application for Tank 2640, and related documents attached hereto in Exhibits also include emails from the District asking Phillips 66 for more information regarding the new tanks project. These emails provide further documentation of the company's intent to use the Carson facility tanks to receive and store tar sands crudes for use in the refinery's operations.

> "As I mentioned on the phone, **I am requesting additional information in support of your crude tanks applications**. Please provide the following information: • Details on the speciation of crude oil (the toxics speciation you used in your TANKS calculations), as well as the origin of this speciation and why you feel it is the worst-case scenario for toxics." (Janice West, AQMD, January 10, 2013) . . . (emphasis added).
>
> "In the attached table, there are columns for SJV[25] crude, "crude oils", Cal crude, and crude hybrid. **What is the origin of "crude oils"?** (Janice West, AQMD, Sept. 3, 2013) . . . (emphasis added).
>
> "**Sorry, I meant *geographic* origin** or other identifier, (similar to California or San Joaquin Valley or Canada), just to identify that column as different and not an average of the others). . . . (Janice West, AQMD, Sept. 3, 2013) . . . (emphasis added).

[25] SJV is San Joaquin Valley – a California crude the company has used historically.

"**Our Crude buyer calls it AWB crude.**[26] **It is from Canada.**" (John W. Matthews, Phillips 66, Sept. 3, 2013) (emphasis added).[27]

Phillips 66's more recent corporate statements also re-iterate the purpose of the tanks. In Phillips 66's 2014 "fact book" description of its "midstream" West Coast operations, the company states the following: "*We are adding additional tankage at our Los Angeles Refinery to increase access to advantaged waterborne crudes.*" This statement directly refutes the District's responses to comments and their reliance on the claim that CBE "incorrectly assumes that increasing crude oil storage capacity will result in a change in the quality of crude oil blend that is processed at the refinery."[28]

In response to comments the District states that "[w]hile SCAQMD staff does not dispute that crude oils have varying chemical properties and characteristics, including sulfur content, the commenter makes an unsubstantiated assumption that the proposed project will cause the type of crude oil delivered to the LARC to change, when in actuality, the proposed project would not affect the ability, nor would it have any effect on the types of crude oil feedstocks that can and will be received at the LARC."[29] Taken together these statements and correspondence point to the presence of substantial evidence that the company specifically intends to bring in a higher volume of advantaged crude oils from Canada, and that the storage tanks in the Project are indeed for the express purpose of facilitating this effort.

The AWB Canadian and other Candian tar sands crudes described above in the Application documents, moreover, are heavy, with extremely high sulfur content. At 4%, these crudes rank much higher in the presence of sulfur as compared to other crude oils that are also considered to be high in sulfur content.[30] For example, when compared to the average California crude oils historically used in the refinery, including San Joaquin Valley and other crudes, the

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[26] AWB stands for Access Western Blend, it is a heavy, highly corrosive and high sulfur diluted bitumen, or tar sands blend. *See* crude monitor description of properties, relative index and data available at: http://www.crudemonitor.ca/crude.php?acr=AWB

[27] *See* attached exhibits.

[28] *See* Appendix F: Phillips 66 Los Angeles Refinery – Carson Plant Crude Oil Storage Capacity Project, throughout.)

[29] See *Id.*, at F-62.

[30] http://www.crudemonitor.ca/crude.php?acr=AWB; *see also* CBE's Technical comment to the Draft Negative Declaration at p. 13.

California Energy Commission found the following:

> Kern County: In 2004, oil from Kern County accounted for 77 percent of California's total onshore production and over **69 percent of the state's total oil production**. Approximately 58 percent of the crude oil has an API of 18 degrees or less. The Kern River oil field, located in the eastern San Joaquin Valley, accounts for approximately 24 percent of Kern County oil. Kern River oil is characteristically heavy and sour with an API of 13.4 degrees and a sulfur content of 1.2 percent.
>
> Los Angeles Basin: The Los Angeles Basin is a sedimentary plain extending from central Los Angeles south through the Long Beach area. The two largest fields by area in this region are the Wilmington and the Huntington Beach fields with average APIs of 17.1 and 19.4 degrees, and average sulfur contents of 1.7 and 2.0 percent, respectively.[31]

Yet, while CBE's comments to the Draft Negative Declaration identified the need for baseline crude slate data including sulfur content at the refinery as necessary to determine the potential overall increase in sulfur content due to the Project, the District failed to do so.

CBE's comments point out that "The ND should have identified baseline crude slates and sulfur content data at the Phillips 66 Los Angeles refinery complex, in addition to the percent sulfur of the unconventional crudes which can potentially be processed due to the Project changes discussed, and volumes of the baselines and crude changes."[32] The Final Negative Declaration, however, states that "The Draft ND does not include a baseline or future changes in crude oil type refined by the LARC because the proposed project will not change, enlarge, or otherwise impact the types and/or quantities of crude oil that LARC currently and will continue to refine."[33] The Final Negative Declaration bases this assertion on its claim that the distillation unit or "crude" unit limits the refinery operation, and without increasing the crude oil there, nothing downstream could change.[34] This statement cannot be true, because crude oil volume limits at the distillation unit do not limit the percent of sulfur in the crude. Downstream of the

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[31] California Crude Oil Production and Imports, California Energy Commission, APRIL 2006, CEC-600-2006-006, available at: http://www.energy.ca.gov/2006publications/CEC-600-2006-006/CEC-600-2006-006.PDF
[32] CBE JMay Draft Negative Declaration Comments at p. 14.
[33] Final ND at p. F-62
[34] *See Id.*

distillation unit inside the refinery, it is the capacity of the sulfur processing units such as the hydrotreaters and sulfur recovery units that limit how much sulfur can be processed.[35]

The Final Negative Declaration fails to provide any baseline for sulfur processing such as the hydrotreater and sulfur recovery units and instead, it merely provides the range of sulfur that can be processed -- 1 to 3%. But, within the refinery's design range, a baseline can fluctuate over years, and the introduction of extremely high sulfur Canadian tar sands crude oil can increase that overall sulfur processing level, which can result in large increases in the amount of extremely toxic and corrosive sulfur compounds processed in the refinery. Thus, the Final Negative Declaration failed entirely to evaluate the potential for a significant increase of sulfur, as compared to the baseline, due to the Project.

The Final Negative Declaration notes that because there is a small range of sulfur that the refinery is designed to process, even if very high sulfur crude is introduced, it can will be mixed with lower sulfur crude so that the average level of sulfur goes down to the designed range that the refinery can process. The District states:

> "The commenter's opinions do not take into account the processing of a crude oil blend, and thus do not reflect the operations at the Refinery. At p. F-40
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> "For instance, if the crude oil to be purchased by the LARC has a sulfur content higher than what can be processed by the equipment, LARC must blend it with a crude oil that has a lower sulfur content, so that the sulfur content of the overall blend falls within the proper specifications. The blend of crude oil that is processed at the LARC contains sulfur between the narrow range of one to three percent based on the processing constraints of the Refinery equipment. In the event that there is no low sulfur crude oil available on-site or for purchase to blend with the higher sulfur content crude oil, the LARC will not purchase the high sulfur content crude oil because it cannot be processed without blending. This process of purchasing and blending crude oils has been in practice at LARC for many years and

[35] *See generally*, Appendix 3 to Chevron Modernization Project, at Exhibit (X), available at: http://chevronmodernization.com/wp-content/uploads/2014/03/Appendix_3_Overview.pdf and the Norwegian University of Science and Technology, available at: http://www.diva-portal.org/smash/get/diva2:649648/FULLTEXT01.pdf and in attached exhibits.

> will not change as a result of the proposed project. For these reasons, the proposed project will not change the types of crude oil processed by the LARC and will not require any modifications to any crude oil refining equipment at the LARC."[36]

Again, the District mischaracterizes CBE's analysis. CBE did account for the range of sulfur in the overall blend processed at the refinery and the District response fails to include any information relevant to establishing an actual sulfur baseline in the refinery. As described above and in more detail in CBE's comments to the Draft Negative Declaration, the question of sulfur baseline is not about whether the refinery can stay within its designed general range of the percent sulfur in individual crude oils processed, it is total baseline that the refinery *has* been operating at over the last few years, and whether the Project will cause an increase in the *total mass* of sulfur, and the overall refinery *average* sulfur percent in the crude oil, and whether the Project will increase those values within the design range. The design range at the refinery is not the basis for a CEQA evaluation, the actual conditions are.[37]

The potential for a significantly increased sulfur percent in the crude oil processed by the refinery due to the Project also may imply higher volumes of hazardous hydrogen sulfide ("H2S") in the refinery, increased danger of corrosion, and increased accident risks, as discussed in CBE's comments on the Draft Negative Declaration. These concerns and potential significant impacts were dismissed by the District on the basis that there was no change to the *types* of crude oils processed as described above, but since the information above shows that there is substantial information providing a fair argument that the refinery plans for the crude oil tanks to facilitate the introduction of "advantaged crudes" including Canadian tar sands crude oils, the Final Negative Declaration's conclusion is incorrect, and it cannot avoid the need for providing a full review and analysis of the potential for increased hazardous sulfur compounds in the refinery that are hazardous to human health and increase accident risk.

H2S is present in sour crude oil, and is also formed in the refinery from the presence of sulfur in the crude oil. More sulfur in the crude oil could mean more H2S in the refinery. While,

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[36] *See* Final Negative Declaration at p. F-44.

[37] *Communities For A Better Environment v. South Coast Air Quality Management District*, 48 Cal.4th 310, 324.

there are also many other acutely hazardous and corrosive sulfur compounds that are formed because of this, H2S remains a large source, and provides another example of what must be evaluated in accounting for the potential environmental impacts of a change in crude slate at the Los Angeles refinery.

CBE discussed the corrosive and accident hazards from H2S in CBE's Draft Negative Declaration comments, and there is a broad range of materials on this subject available. The District is well aware of this but refused to address issues related to the increase in H2S because it erroneously concluded there is no nexus between the crude oil tanks and the high sulfur crude plans of the company.

A study by the Norwegian University of Science and Technology explains in detail, the history of H2S chemistry in oil refineries.[38] The report summarizes many points about hazardous sulfur chemistry due to sour crude oil as follows:

> "The sulfur compounds in crude oils and natural gas generally exist in the form of free sulfur, hydrogen sulfide, thiols, sulfides, disulfides, and thiophenes. These compounds can cause considerable technical, environmental, economic, and safety challenges in all segments of petroleum industry, from upstream, through midstream to downstream. . .
>
> . .
>
> The major corrosion problems in oil and gas processing facilities are not caused by hydrocarbons but by various inorganic compounds, such as water, hydrogen sulfide, hydrofluoric acid, and caustic. There are two essential sources of these conglomerates: feed-stock contaminants and process chemicals, including solvents, neutralizers, and catalysts (Nenry & Scott, 1994)."[39]

The 2014 EIR for the Chevron Richmond Refinery Modernization Project also describes this hydrotreating sulfur removal process that is present in refineries, and describes how these impurities can interfere with refinery processes. For example, Section 3.2.2 of Appendix 3 to that document states:[40]

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[38] Production and processing of sour crude and natural gas - challenges due to increasing stringent regulations, Norwegian University of Science and Technology, 2013, http://www.diva-portal.org/smash/get/diva2:649648/FULLTEXT01.pdf

[39] *Id.*

[40] Chevron Refinery Modernization Project EIR, March 2014, Appendix 3, Overview of Oil Refining Process, Chevron Modernization Project, 2013, http://chevronmodernization.com/wp-

"Another important natural characteristic of crude oil is that different types of crude oil have differing amounts of sulfur content. Sulfur occurs naturally in crude oil, but sulfur content is restricted by federal and State air quality laws in refined products (e.g., there are standards limiting the amount of sulfur that can be present in refined products like gasoline). To meet these regulatory restrictions on sulfur content in refined products, sulfur is removed from the various fractions of crude oil during the refining process. [emphasis added] ...

When an oil has less sulfur, it is referred to as being "sweet." Crudes with more sulfur are referred to as being "sour." Although there is no regulatory threshold of sulfur content for dividing sweet crude oils from sour crude oils, oils with less than 0.5% sulfur content are generally referred to as "sweet." ...

Most sulfur present in crude oil is bonded within hydrocarbon molecules, although some is present as hydrogen sulfide (H2S) gas . This is different from "elemental" or pure sulfur (a yellow crystalline substance when at room temperature), which is a usable product. During the refining process, the sulfur atom is removed from the hydrocarbon molecule. **This process is called "hydrotreating"** because it includes the use of hydrogen. The hydrocarbon fractions are combined with hydrogen in the presence of a catalyst and elevated temperatures and pressures. The catalyst, temperature, and pressure separate the sulfur from the hydrocarbon molecule and the sulfur combines with the available hydrogen to produce a gas called hydrogen sulfide (H2S). This hydrogen sulfide gas is then treated, as explained below, to create "elemental" sulfur, which is sold as a product by Chevron. The Modernization Project includes several components to allow Chevron to remove more sulfur from the Facility's feedstocks and thereby refine higher sulfur crude oil and gas oil in the future."

Section 3.4.2 of the same document further provides:

"Hydrocarbons separated in the crude unit distillation process and SDA unit contain naturally occurring sulfur and other natural impurities such as nitrogen and metals. One of the key later steps in the refinery process involves chemical reaction processes that include a "catalyst" – a material that promotes or speeds up chemical reactions to produce either a finished product or another interim material to be processed further, such as in the Cracking step. These impurities can interfere with the cracking processes.

content/uploads/2014/03/Appendix_3_Overview.pdf

An example of the kinds of accidents and releases that can occur in sulfur processing units was listed in a Contra Costa County Northern California website publication, in a summary of refinery accidents. The H2S release described there occurred during a hydrotreater upset:

> "An upset occurred in the straight run hydrotreater unit in the light oil processing area. Subsequently, fires occurred in the vacuum flasher heater furnace and crude unit heater furnace. Hydrocarbons, H2S, and smoke released offsite. Level 3 under CWS, sirens activated."[41]

An added example of the range of potential impacts from the increased presence of H2S is contained in the Agency for Toxic Substance and Disease Registry, (ATSDR) H2S Fact Sheet. That fact sheet states that:

> "*Just a few breaths of air containing high levels of hydrogen sulfide gas can cause death. Lower, longer-term exposure can cause eye irritation, headache, and fatigue.*"[42]

While CBE does not dispute that Phillips 66 can buy a range of crude oils, there is also no disputing that the company explicitly plans to use the Project tanks to facilitate a significant increase in receiving, storing and processing "advantaged crude" oils, and specifically tar sands and Bakken crudes, as has been made clear repeatedly by its own representatives. It is also well known and documented on the record including the exhibits attached hereto, that heavy, high sulfur Canadian crude oils and Bakken crudes carry serious environmental and human health implications.[43] In addition to the procedural and other substantive flaws contained in the District's approval and certification of the Final Negative Declaration for the Project, the Final Negative Declaration fails to evaluate the baseline and fails to account for increased sulfur processing in the refinery due to the potential major increase in high sulfur crude oil. The Final

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[41] Contra Costa County – including Equilon refinery hydtrotreater accident, July 18, 2001, http://cchealth.org/hazmat/accident-history.php

[42] ATSDR, 2006, Division of Toxicology and Environmental Medicine ToxFAQs, http://www.atsdr.cdc.gov/tfacts114.pdf

[43] These two crudes are those which have been identified by Phillips 66 as explicitly included in the company's current definition of "advantaged" or "cost advantaged" crudes, as they are relatively less expensive than other crudes and can greatly increase Phillips 66's profit margin. While these two crude types may cause distinct impacts, both indisputably cause significant, detrimental impacts as a result of their chemical composition and blend with diluents as further described in the attached exhibits including the expert reports from Dr. Phyllis Fox, submitted for the purpose of analyzing impacts from similar projects elsewhere in the state. See Exhibits U, included in attached Exhibit Index, with exhibits forthcoming.

Negative Declaration thereby ignores the critical need to evaluate the potential significant impacts due to increased hazardous sulfur materials in the refinery and dismisses the possibility that the refinery's current baseline sulfur content could increase. By this omission the Final Negative Declaration omits a necessary analysis of substantial evidence supporting a fair argument that the Project has the potential to cause significant environmental impacts, due to the potential to greatly increase Canadian tar sands crude oil as described above, and as further described in CBE's comments to the Draft Negative declaration. The District also appears to assume that because N. Dakota Bakken crude oil has been used at the refinery previously it was not necessary to evaluate environmental impacts caused by significant increases in the use Bakken crude oil that will be facilitated by the Project. As previously discussed, Phillips 66 specifically stated that the new tankage as for the purpose of bringing in "advantaged crude" oils. Phillips identified both Canadian crude and N. Dakota Bakken crude oil as the two advantaged crudes it is seeking to bring to the refinery. CBE provided information in the comments on the Draft ND on the problems of Bakken crude oils, which are more volatile and can increase accident risk in refineries.

Furthermore, the Department of Transportation has published safety alerts for all forms of transport of Bakken crude oil (not just rail), so the ship transport proposed in the Project is also vulnerable to this increased danger due to the volatility of this crude oil.[44] Baselines of the refinery crude oil in general are missing and an evaluation of the impacts of the increases in Bakken crude oil in transportation, and in the refinery are also missing, because the District stated there is no nexus between the company's advantaged crude plans and the new tanks. Phillips 66 statements, however, clearly warrant a full evaluation of these potential impacts.

Other characteristics of the "advantaged" crudes, or specifically the AWB crudes identified by Phillips 66 in correspondence to the Distrcit, such as its vapor pressure or flammability, may also differ in significant ways from the crudes processed in the Los Angeles Refinery's current crude slate. These other constituents and properties are not a function of the

[44] The U.S. Department of Transportation Pipeline and Hazardous Material Safety Administration, January 2, 2014, http://phmsa.dot.gov/pv_obj_cache/pv_obj_id_111F295A99DD05D9B698AE8968F7C1742DC70000/filename/1_2_14%20Rail_Safety_Alert.pdf, included in attached Exhibit Index, exhibits forthcoming.

API gravity or the sulfur content and are present independent of them. Thus to the extent the District relies on its responses to comments to refute the need to analyze the impacts from these new, distinctly sourced crudes, the District is incorrect.

The vapor pressure of crude determines to a large extent the amount of reactive organic compound (ROG) and Toxic Air Contaminant (TAC) emissions that are released when crude is transported, stored, and refined. Thus, a crude slate may even have identical sulfur content and weight, but would still result in dramatically different ROG and TAC emissions.[45] Similarly, the nature of the chemical bonds in crude determines the amount of energy and hydrogen that must be supplied to refine it. Thus, a crude slate may have identical sulfur and weight, but a different mix of chemicals that would affect the amount of energy and hydrogen required to convert it into refined products.[46]

These differences—in both chemical and physical characteristics other than API gravity and sulfur content— fluctuate independent of sulfur content and API gravity and will result in significant impacts that have not been considered by the District, and are absent from the District's responses to comments, and the Final Negative Declaration analyses. Just some of these impacts include, for example, significant increases in ROG emissions, contributing to existing violations of ozone ambient air quality standards; significant increases in TAC emissions, resulting in significant health impacts in an already over-burdened local setting as described in more detail below; significant increases in malodorous sulfur compounds, resulting in significant odor impacts; significant increases in combustion emissions, contributing to existing violations of ambient air quality standards; and significant increases in flammability, thus increasing the potential for more dangerous accidents involving storage and process equipment

Moreover, as explained in response to similar project proposals, the above crude characteristics also contribute to train derailments or spills on-site.[47] And, the Final Negative

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[45] *See* Exhibit U. Dr. Fox report to Valero Crude By Rail Project EIR – Benicia.
[46] *Id.*
[47] *Id.*

Declaration and the District's responses to CBE comments fail to respond to CBE comments raising these concerns. For example, the District stated in the Final ND that a new condition will be set so that the Project tanks will not receive crude oil brought in by rail. Because the project tanks represent an extremely large new source of crude oil storage and throughput (over 50 million barrels per year in throughput), this condition does preclude the Project from having a significant potential to allow an increase in transport by rail. Indeed, the extent of increase in the overall throughput capacity involved in the project, appears to show that the Project will free up other existing storage tank space in the refinery. Since the refinery is not taking a permit requirement that precludes crude by rail offloading to *all* refinery tanks, the Project also has the potential to also allow an increase in crude offloading by rail in other parts of the refinery, in addition to the crude offloading by ship to these Project tanks. Consequently, the potential impacts from rail still need to be evaluated.

3. The District's decision to approve and certify the Negative Declaration ignores cumulative impacts from other projects and environmental justice concerns.

Currently there are 3 refinery projects being proposed in Wilmington and the adjacent City of Carson, as well as additional project-related permit applications at various stages of review by the District. All 3 projects directly impact many of CBE's members and other residents living *directly on the fenceline* of the refineries at which they are being proposed.

These 3 projects include:

1) The Project at issue in this appeal;

2) The Phillips 66 Wilmington Ultra Low Sulfur Diesel Project, for which the District issued a Draft EIR on September 26, 2014; and

3) The Tesoro-BP Refinery Integration Project, for which the District issued a Notice of Preparation of a Draft Environmental Impact Report on September 9, 2014 (and for which the District is also reviewing two Title V permit revisions and renewals--for the Tesoro Marine Terminal 2 and the Tesoro Hynes Terminal in Long Beach).

Wilmington and the cities of Carson and Long Beach rank among the State's top most

pollution-burdened and vulnerable areas.[48] Residents of these communities live with the day-to-day impacts of various forms of heavy industry, oil extraction and refining operations, port and other goods-movement and transport activities, including significant levels of air pollution caused by diesel truck and railroad transport.[49] As such, these residents rely heavily on the oversight of agencies like the District to ensure that permitting and project approval decisions regarding additional, highly polluting industrial projects are made wisely, with careful attention to the true range of environmental and health impacts resulting from each individual project alone, and in the context of existing cumulatively considerable burdens.[50]

Despite the existing burden on this area, the District is conducting an impermissibly superficial level of environmental review for projects directly impacting some of the region's most vulnerable neighborhoods. While this problem is in large part a result of inaccurate and often misleading project descriptions contained in the applications submitted by refinery operators, the District is responsible for ensuring that CEQA and other air quality and human health protective requirements are met before it moves forward in issuing or approving any permits or other project-related approvals, including approvals of environmental review documents and permit renewals or revisions.[51]

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[48] Wilmington, Carson and parts of Long Beach rank in the top 20% (with several areas in the top 5%) most overburdened and vulnerable areas in the State according to the most recent version of the California Environmental Protection Agency's CalEnviroScreen, version 2.0. (*See* http://oehha.maps.arcgis.com/apps/OnePane/basicviewer/index.html?&extent={"xmin":-13166567.802417224,"ymin":4001409.3038827637,"xmax":13157213.82108084,"ymax":4005584.676552836,"spatialReference":{"wkid":102100}}&appid=a4a95185c71f4817bf03aeae25923695 (last accessed, Dec. 23, 2014).

[49] *See Id.*

[50] *See, Laurel Heights Improvement Assn. v. Regents of Univ. of California* (1988) 47 Cal.3d 376, at 394 (holding that the significant cumulative effects of a project must be considered in an EIR, and specifying that such required cumulative effects should encompass "past, present, and reasonably anticipated future projects."); *see also*, CEQA Guidelines, § 15064 (h)(1) (also requiring preparation of an EIR, where cumulative impacts are considerable, and providing that "[w]hen assessing whether a cumulative effect requires an EIR, the lead agency shall consider whether the cumulative impact is significant and … An EIR must be prepared if [a] Project's incremental effect, though individually limited, is cumulatively considerable[,]" meaning that "incremental effects of an individual project are significant when viewed in connection with the effects of past projects … other current projects, and … probable future projects"), and §15355 ("'Cumulative impacts' refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts"); *see also*, Clean Air Act, Declaration of Purpose, at 42 U.S.C. § 7401(b)(1)-(3), (c)(providing that the purpose of the Act is to enhance the quality of the Nation's air resources so as to promote the public health and welfare; and to encourage and assist the development and operation of regional air pollution prevention and control programs to do the same.).

[51] *See* Cal. Pub. Res Code § 21082.2(a) (requiring the lead agency to determine whether a project may have a significant effect on the environment based on substantial evidence in light of the whole record.); *see also Citizens*

4. The District has no process for appealing a staff's decision on a negative declaration.

Counsel for CBE has extensively reviewed the District Rules, website and other materials. There are no procedures for appealing staff decisions on CEQA documents for projects where the District is the lead agency. Also, the Final Negative Declaration included no procedures for appealing the decision. Given the vital import of this project and the information provided on the processing of more dangerous crude oil at this facility, the public and the Governing Board members must have a robust review process. Accordingly, the District should withdrawl its staff approval, adopt a procedure for processing appeals of this sort through an official process, and then process this appeal according to these duly adopted protocols. If the District decides to process the appeal in an ad hoc manner, we respectfully request that CBE be provided at least 30 minutes to present to the Governing Board. Moreover, the public should be provided the opportunity to comment on this item at a duly noticed Governing Board meeting.

Assoc. For Sensible Development of Bishop Area v. County of Inyo (1985) 172 Cal.App.3d 151("The lead agency must consider the whole of an action, not simply its constituent parts, when determining whether it will have a significant environmental effect."); and *see* CEQA Guidelines § 5041(setting forth the Lead Agency's Authority to mitigate negative environmental impacts, and providing that "A lead agency for a project has authority to require feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant effects on the Environment.").

III. CONCLUSION

For these reasons, and for the additional reasons expressed in CBE's comments on the above listed projects, as well as the additional, attached correspondence and exhibits we appeal the District's certification of the Negative Declaration and we urgently request that the District take immediate steps to withdraw the December 12, 2014 Notice of Determination of the approval and certification of the Final Negative Declaration for the Phillips 66 Carson Project.

Dated: January 9, 2015

Respectfully submitted,

/ s

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COMMUNITIES FOR A BETTER ENVIRONMENT

Comments

on

Revised Draft Environmental Impact Report

for the

Phillips 66
Rail Spur Extension
and Crude Unloading Project

Santa Maria, California

Prepared

for

Communities for a Better Environment
Sierra Club
ForestEthics
Center for Biological Diversity

November 24, 2014

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I. INTRODUCTION

The Phillips 66 Santa Maria Refinery (SMR), located in San Louis Obispo County, is proposing to modify an existing rail spur to accommodate train delivery of cost-advantaged crude oils, to replace local supplies. The proposed tracks and unloading facilities would be designed to accommodate unit trains of up to five unit trains per week, consisting of 80 tank cars and associated locomotives and other supporting cars as well as periodic manifest trains of fewer cars not dedicated to SMR oil (Project). I was asked by Communities for a Better Environment (CBE), the Sierra Club, ForestEthics, and the Center for Biological Diversity to review the Revised Draft Environmental Impact Report (RDEIR or Santa Maria RDEIR)[1] and prepare comments on a limited number of issues. This RDEIR replaces a former Draft Environmental Impact Report on a similar Project (DEIR)[2] issued in November 2013 that I also commented on.

My evaluation, presented below, indicates the RDEIR fails to disclose the link between the Rail Spur Project and three other directly related projects: (1) the Propane Recovery Project at Phillips 66's Rodeo facility; (2) the Rodeo Refinery Marine Terminal Offload Limit Revision Project; and (3) the Throughput Increase Project at the Santa Maria Refinery. The impacts of these directly related projects should have been evaluated as a single project. Together, they result in many significant impacts that were not disclosed in the Rail Spur Project RDEIR.

The RDEIR fails to evaluate the impacts resulting from a significant switch in crude slate, from locally sourced heavy crudes to tar sands crudes. The entire Project, comprising the four piecemealed projects, would result in significant unmitigated air quality, global warming, water supply, biological, and corrosion-caused risk of upset and other impacts, either not disclosed, improperly analyzed, or not mitigated in the RDEIR.

Finally, the RDEIR's hazard analysis fails to include the portions of the route where train accidents are most likely to occur due to steep grades and poor condition of tracks and bridges – from the stateline to the rail yards in Roseville and Colton, fails to analyze a worst case spill, and fails to disclose the significant difficulty of cleaning up a tar sands spill to waterways. The railroad tracks in these omitted areas parallel the water supply for most of California. A derailment that spilled significant amounts of tar sands crudes in these waterways could shut down the water supply for most of the state, resulting in significant unmitigated impacts on agricultural and municipal water supplies and significant aquatic biological impacts.

My resume is included in Exhibit 1 to these comments. I have over 40 years of experience in the field of environmental engineering, including air emissions and air pollution

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[1] San Luis Obispo County, Phillips 66 Company Rail Spur Extension and Crude Unloading Project Revised Public Draft Environmental Impact Report and Vertical Coastal Access Project Assessment, October 2014, SCH # 2013071028; Available at: http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/Phillips+66+Company+Rail+Spur+Extension+Project+(Oct+2014)/Phillips+SMR+Rail+Project+Public+Draft+EIR.pdf.

[2] Marine Research Specialists (MRS), Phillips 66 Company Rail Spur Extension Project Public Draft Environmental Impact Report and Vertical Coastal Access Assessment, November 2013.

control; greenhouse gas emission inventory and control; air quality management; water quality and water supply investigations; hazardous waste investigations; hazard investigations; risk of upset modeling; environmental permitting; nuisance investigations (odor, noise); environmental impact reports/statements, including California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documentation; risk assessments; and litigation support.

I have M.S. and Ph.D. degrees in environmental engineering from the University of California at Berkeley with minors in Hydrology and Mathematics. I am a licensed professional engineer (chemical, environmental) in five states, including California; a Board Certified Environmental Engineer, certified in Air Pollution Control by the American Academy of Environmental Engineers; and a Qualified Environmental Professional, certified by the Institute of Professional Environmental Practice.

I have prepared comments, responses to comments and sections of EIRs for both proponents and opponents of projects on air quality, water supply, water quality, hazardous waste, public health, risk assessment, worker health and safety, odor, risk of upset, noise, land use and other areas for well over 100 documents. This work includes Environmental Impact Reports (EIRs), Negative Declarations (NDs), and Mitigated Negative Declarations (MNDs) for all California refineries as well as various other permitting actions for tar sands and light shale crude refinery upgrades in Indiana, Louisiana, Michigan, Ohio, South Dakota, Utah, and Texas and liquefied natural gas (LNG) facilities in Texas, Louisiana, and New York. I was a consultant to a former owner of the subject refinery on CEQA and other environmental issues for over a decade and am thus very familiar with both the Rodeo Refinery and the Santa Maria Refinery and their joint operations.

My work has been cited in two published CEQA opinions: (1) *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (August 30, 2001) 111 Cal.Rptr.2d 598 and *Communities for a Better Environment v. South Coast Air Quality Management Dist. (2010) 48 Cal.4th 310.*

II. THE PROJECT IS PIECEMEALED

The Phillips 66 San Francisco Refinery (SFR) consists of two facilities linked by a 200-mile pipeline. Santa Maria RDEIR, Fig. 2-2. The Santa Maria Refinery (SMR) is located in Arroyo Grande, in San Luis Obispo County, while the Rodeo Refinery is located in Rodeo in the San Francisco Bay Area. The Santa Maria Refinery mainly processes heavy, high sulfur crude oil and sends semi-refined liquid products, *e.g.*, gas oil and pressure distillates[3], to the Rodeo Refinery for converting into finished products. See, *e.g.*, Propane Recovery RDEIR, p. 3-25.

[3] The permits to operate for the Santa Maria Refinery and various pump stations along the pipeline indicate that the materials sent from Santa Maria to Rodeo are gas oil and "pressure distillates." The "pressure distillates" are referred to as "naphtha" in the subject RDEIRs. However, there are different types of naphtha, depending upon the boiling range. Full range naphtha, which is presumably what "pressure distillate" is intended to capture, is the fraction of hydrocarbons boiling between 30 C and 200 C. It consists of a complex mixture of hydrocarbons generally having between 5 and 12 carbon atmos and comprises 15% to 30% of the crude oil by weight. Light naphtha is the fraction boiling between 30 C and 90 C and consists of molecules with 5 to 6 carbon atoms. See, *e.g.*, http://en.wikipedia.org/wiki/Naphtha.

Phillips 66 is planning to replace a significant portion of its baseline crude slate with cost-advantaged crudes delivered to its California refineries by ship and rail. There are currently four related projects at the San Francisco Refinery (comprising the Santa Maria and Rodeo Refineries) that have recently been permitted or that are currently in the process of being permitted that are inextricably linked and should have been evaluated as a single Project under CEQA. Two are located at the Rodeo end of the pipeline and two are located at the Santa Maria end of the pipeline. These four projects are:

1. Santa Maria Refinery Throughput Increase Project;[4]
2. Santa Maria Refinery Rail Spur Project (RDEIR);
3. Rodeo Refinery Propane Recovery Project;[5]
4. Rodeo Refinery Marine Terminal Offload Limit Revision Project.[6]

I previously commented on the relationship between the Santa Maria Refinery Throughput Project, the Santa Maria Refinery Rail Spur Project,[7] and the Rodeo Refinery Propane Recovery Project[8] in comments on previous CEQA documents. These comments are included here in Exhibits 2 and 3. I reassert these comments as they are still valid and have not been addressed in either the Santa Maria Refinery Rail Spur Project RDEIR or the Propane Recovery RDEIR.

However, the SMR Rail Spur Project and Rodeo Refinery Propane Recovery RDEIRs both raise a new issue that seeks to demonstrate that these two projects are not related. This new issue, an alleged vapor pressure constraint, has not been addressed in other comments on piecemealing. The SMR Rail Spur Project RDEIR, p. 2-31, asserts out of the blue, without mentioning the Rodeo Refinery Propane Recovery Project:

> "Prior to pipeline shipment to the Rodeo Refinery the naphtha and gas oils are stored in tanks located at the SMR. These storage tanks have vapor pressure limits are required by the San Luis Obispo County Air Pollution Control District (SLOAPCD) permit, which limits the vapor pressure to 11 pisa [sic]. Historically, and currently the SMR tanks operate at about 10 psia (pounds per square inch absolute). These pressure limits restrict the amount of propane/butane that can be contained in naphtha and gas oils that are shipped to the Rodeo Refinery. The majority of the

[4] Marine Research Specialists, Phillips 66 Santa Maria Refinery Throughput Increase Project, Final Environmental Impact Report, October 2012 (SMF FEIR); Available at: http://slocleanair.org/phillips66feir.

[5] Contra Costa County Department of Conservation and Development, Phillips 66 Propane Recovery Project Recirculated Draft Environmental Impact Report, SCH # 2012072046, October 2014, Available at: http://www.cccounty.us/DocumentCenter/View/33804.

[6] ERM and BAAQMD, CEQA Initial Study, Marine Terminal Offload Limit Revision Project, Phillips 66 Refinery, Rodeo, California, BAAQMD Permit Application 22904, December 2012; Phillips 66, Application for Authority to Construct and Minor Modification to Major Facility Review Permit, Revision of Permit Condition 4336 Part 7, Phillips 66 San Francisco Refinery; Major Facility Review Permit, Phillips 66 – San Francisco Refinery, Facility #A0016, Condition 4336, pp. 497-498, August 1, 2014.

[7] Phyllis Fox, Comments on Environmental Impact Report for the Phillips 66 Rail Spur Extension Project, Santa Maria, California, Prepared for Sierra Club, San Francisco, January 27, 2014.

[8] Phyllis Fox, Comments on Environmental Impact Report for the Phillips 66 Propane Recovery Project, Prepared for Shute, Mihaly & Weinberger LLP on behalf of Rodeo Citizens Association, November 15, 2013.

propane/butane that is contained in the crude oils process at the SMR ends up in the refinery fuel gas. Figure 2-10 provides a simplified flow diagram of the SMR."

The Rodeo Refinery Propane Recovery Project RDEIR, on the other hand, includes a brief discussion of the Santa Maria Refinery. This discussion first asserts that "[t]he proposed Project [Propane Recovery] is independent of and would have no effect on SMF [Santa Maria Facility] operations." Propane RDEIR, p. 3-25. It goes on to make an argument, again out of the blue, that is very similar to the one cited above from the Santa Maria Refinery Rail Spur Project RDEIR (Propane RDEIR, pp. 3-25/26):

> "The storage tanks located along the 200-mile pipeline between the two refineries have maximum vapor pressure limits imposed by the San Luis Obispo County and San Joaquin Valley Air Pollution Control Districts which constrain the amount of butane and propane that can be included in the semi-refined products. Increasing the amount of butane and propane in the semirefined products would increase the vapor pressure of the material. Historically and currently these storage tanks contain products which are at or near the maximum vapor pressure limits. Additional butane and/or propane would cause the products to exceed the vapor pressure limits of the storage tanks. Accordingly, no new butane and propane can be added to the semi-refined products sent from the Santa Maria Refinery to the Rodeo Refinery regardless of the types of crude oil that may be processed at the Santa Maria Refinery."

These arguments attempt to demonstrate that there can be no link between these two projects as vapor pressure permit limits on tanks that store the gas oil and pressure distillate sent from Santa Maria to Rodeo would prohibit any increase in propane and butane as they historically and currently operate near their limits. These claims are incorrect as the assertions are wrong. There either are no vapor pressure limits on the subject tanks, or the materials stored in them have vapor pressures far below their permitted limits.

A. Vapor Pressure Constraints Are Unsupported

The RDEIRs contains no support whatsoever for these vapor pressure claims. Thus, it fails as a CEQA document. Support should include identification of the permits, tanks, and permit conditions that restrict vapor pressure and certified vapor pressure monitoring data for each subject tank. None of this information is in the record.

Therefore, I researched the issue, obtained permits, and identified the tanks that store the subject gas oil and pressure distillate, and obtained vapor pressure monitoring data from the San Luis Obispo County Air Pollution Control District (SLOCAPCD). My research indicates that these claims are wrong.

I. Santa Maria Refinery Tanks

The Santa Maria Refinery produces two semi-refined products – gas oil and pressure distillate. These products are stored in on-site tanks and sent by pipeline to the Rodeo Refinery to convert them to finished products such as gasoline. Emissions from these tanks are regulated by the SLOCAPCD Permit to Operate for the Santa Maria Refinery (Refinery Permit).[9] The Refinery Permit indicates that gas oil is stored in Tanks 800 and 801 and pressure distillate is stored in Tanks 550 and 511. PTO Conditions II.B.1.a and d, p. 8. The vapor pressure of the materials stored in these tanks should not appreciably change during pipeline transport to Rodeo. As discussed below, the vapor pressures of both gas oil and pressure distillate stored in tanks at the Santa Maria Refinery sent to Rodeo are significantly less than claimed in the RDEIRs.

a. Pressure Distillate Tanks 800/801

Pressure distillate, the more volatile of the two semi-refined products, is stored in 52,000-barrel, welded-shell, dome-roof tanks that are controlled by a methane blanket and vapor recovery system (Process A-2). These tanks must comply with SLOCAPCD Rule 425[10]. Rule 425, Section D.5.b applies. This section exempts these tanks from vapor pressure limits as emissions are controlled with a vapor loss control device listed in Section E.3 (E.3 Vapor Recovery System). Thus, there are no vapor pressure limits on the tanks that store pressure distillate that is sent to Rodeo as the vapors are recovered, contrary to the assertion in the SMR Rail Spur Project RDEIR that there is a vapor pressure limit of 11 psia.

The SMR Rail Spur Project RDEIR further asserts that the "SMR tanks operate at about 10 psia", without identifying the tanks. SMR Rail Spur Project RDEIR, p. 2-31. As gas oil is much less volatile, this comment likely refers to pressure distillate. Regardless, even if the pressure distillate tanks were limited to a vapor pressure of 11 psia (which they are not as they are otherwise controlled), the vapor pressure of the pressure distillate that is stored in them is not "about 10 psia". Rather, annual emission inventory data obtained from the SLOCAPCD (Exhibit 4) indicate that the pressure distillate tanks have operated at 6.2 psia over the period 2009 to 2013. Thus, the claims in the SMR Rail Spur Project RDEIR, p. 2-31, are wrong as to the pressure distillate storage tanks at the Santa Maria Refinery. These tanks do not have vapor pressure limits as they are controlled. Further, they are operating far below the erroneously claimed limit of 11 psia.

b. Gas Oil Tanks 500/501

Gas oil is stored in 76,500 barrel welded-shell, external floating pontoon roof, single shoe seal tanks. Rule 425, Section D.4, limits the vapor pressure of these tanks to 0.5 psia. Vapor pressure data that I obtained from the SLOCAPCD (Exhibit 4) indicate that the gas oils stored in these tanks had true vapor pressures of 0.27 psia over the period 2009 to 2013, much less

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[9] Permit to Operate No. 44-52, Phillips 66 Company - Santa Maria Refinery, November 6, 2013.

[10] SIP Rule 407.A.2, also cited in this condition, is superceded by Rule 425. Email from Dean Carlson, SLOCAPCD, to Phyllis Fox, November 21, 2014, Re: SMR Questions, Response (2).

than 0.5 psia. The SLOCAPCD permit engineer explained that when higher vapor pressure material is encountered, it is routed to the pressure distillate tanks.[11]

2. The SMR-to-Rodeo Refinery Pipeline

The semi-refined products stored in Tanks 500, 501, 800, and 801 are pumped into the 200-mile long pipeline and sent to Rodeo for refining into finished products. There are several pump stations along this pipeline, used to increase the pressure as needed to overcome pressure losses from friction during transport. Storage tanks are present at some of these pump stations.

These materials are generally sent directly to Rodeo, without being diverted to tanks along the pipeline, as suggested in the Propane Recovery Project RDEIR, pp. 3-25/26. Phillips Pipeline LLC modified operation of this pipeline several years ago to reduce off-loading of gas oil and pressure distillate at pump stations.[12] While it is possible that an upset or operational abnormality could require material to be temporarily offloaded at pump station tanks, this is not the normal operational mode. Further, as discussed elsewhere, the vapor pressure of the semi-refined products are far below the vapor pressure limits. The former Creston and Summit pump stations were not needed after the operational change and thus no longer have active permits.[13] Other pump stations along the pipeline are primarily used just to push the material along.[14]

Thus, gas oil and pressure distillate that enters the pipeline at Santa Maria arrive at Rodeo with the same vapor pressure. The operation is steady state with little variation in measured vapor pressures from year to year.[15] The vapor pressure data reported by SLOAPCD (Exhibit 4) indicates that these tanks operate far below their permit limits. Within the SLOCAPCD, only the Santa Margarita and Shandon pump stations have active SLOCAPCD permits for storage tanks.

a. SLOCAPCD Pump Stations

Santa Margarita Pump Station Tanks

The Santa Margarita Pump Station Permit to Operate[16] lists four tanks. Three of them (55422, 55408, 110404) have vapor pressure limits of 11 psia, consistent with pressure distillate. Two of these pressure distillate tanks (55422, 55408) are vented to a carbon absorption vapor control system when pressure distillate is stored. The fourth tank (175420) has a vapor pressure limit of 1.5 psia. Vapor pressure data that I obtained from the SLOCAPCD (Exhibit 4) indicates the following vapor pressure ranges for these four tanks over the period 2009 to 2013:

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[11] Personal communication, Dean Carlson, SLOCAPCD, to Phyllis Fox, November 20, 2014.

[12] Email from Dean Carlson, SLOCAPCD, to Phyllis Fox, November 21, 2014, Re: SMR Questions, Response (5).

[13] Email from Dean Carlson, SLOCAPCD, to Phyllis Fox, November 20, 2014, Re: P66 Pump Stations.

[14] Email from Dean Carlson, SLOCAPCD, to Phyllis Fox, November 21, 2014, Re: SMR Questions, Response (5).

[15] Email from Dean Carlson, SLOCAPCD, to Phyllis Fox, November 21, 2014, Re: SMR Questions, Response (4).

[16] SLOAPCD, Permit to Operate Number 404-9, Phillips Pipeline LLC, Santa Margarita Pump Station, May 2, 2012, Condition 5.

- Tank 55408: 0.26 to 4.79 psia (limit: 11 psia)
- Tank 55422: 0.36 to 5.05 psia (limit: 11 psia)
- Tank 11040: 0.24 to 0.4 psia (limit: 11 psia)
- Tank 175420: 0.07 to 0.49 psia (limit: 1.5 psia)

All of these tanks are operating at vapor pressures far below their permit limits. Thus, the claim in the RDEIRs that they are operating close to their limits, precluding any increase in propane and butane, is incorrect.

Shandon Pump Station Tank

The Shandon Pump Station Permit to Operate lists a single 35,000 barrel pontoon floating roof tank, permitted to store organic liquids with a true vapor pressure not to exceed 1.5 psia.[17] The SLOCAPCD inventory data also indicate that gas oil has been stored in this tank. Over the period 2009 to 2013, the true vapor pressure ranged from 0.12 psia to 0.24 psia, substantially lower than the 1.5 psia vapor pressure limit. Thus, the claim in the RDEIRs that this tank is operating close to its vapor pressure limit, precluding any increase in propane and butane, is incorrect.

b. SJVAPCD Pump Station Tanks

There are five pump stations in the San Joaquin Valley Air Pollution Control District (SJVAPCD) along the subject pipeline that have active permits to operate and which include tanks that could store gas oils and pressure distillate, if offloaded during transit to the Rodeo Refinery: (1) McKittrick (S1521); (2) Sunset (S 1522); (3) Shale (S1523); (4) Midway (S1525); and (5) Junction (S 1518). While I was unable to obtain either permits to operate or vapor pressure data for these tanks due to inadequate review time, there is no reason to expect that the vapor pressure of the SMR gas oils and pressure distillates shipped out of the SLOCAPCD into the segment of the pipeline under the jurisdiction of the SJVAPCD (and beyond the Bay Area Air Quality Management District (BAAQMD)) would change during transit to Rodeo. Further, there would be little if any reason to transfer pipeline material into these tanks, once destined for Rodeo.

[17] SLOCAPCD, Permit to Operate Number 505-4, Phillips Pipeline LLC, Shandon Pump Station, May 2, 2012, Condition 5.

B. Refinery Fuel Gas

The SMR Rail Spur Project RDEIR asserts that the majority of the propane and butane would be partitioned into the refinery fuel gas. SMR Rail Spur Project RDEIR. p. 2-31. This depends on the design of the crude tower, *i.e.*, the temperature cut points, which was not disclosed in the RDEIR. Distillate cut points could be optimized to route more of the propane and butane into the naphtha. However, I agree that most of the butane likely would be partitioned into the refinery fuel gas, but a significant amount of the propane would be present in the pressure distillate. Butane is present in much lower amounts than propane in the tar sands crudes identified in the RDEIR.

Regardless, the amount partitioned to the fuel gas at Santa Maria would depend on the amount present in the imported crudes, which would depend largely on the type of diluent if tar sands are imported, or otherwise, the specific light crude, as some are highly enriched in propane and butane.

The SMR Rail Spur Project RDEIR fails as a CEQA informational document as none of the information required to address this point is disclosed. Further, the semi-refined products from refining rail-imported crudes at the Santa Maria Refinery will generate additional amounts of propane and butane when refined at Rodeo, compared to the SMR baseline crude slate. Thus, the fuel gas argument is without merit.

C. Source of Increased Amounts of Propane and Butane Feedstocks at Santa Maria Refinery

The Santa Maria Rail Spur Project and Propane Recovery Project RDEIRs attempt to rebut any connection between these two projects by hiding behind the vapor pressure argument. However, this argument is not persuasive, as demonstrated above. In fact, most all of the cost-advantaged crudes flooding into the market will allow the SMR to produce propane/butane-rich, semi-refined products and the Rodeo Refinery to recover more propane and butane from them than available in their baseline crude slates.

The amount of propane and butane (or its precursors) in the Santa Maria Refinery rail-imported crudes could be substantial, significantly more than in the SMR baseline crude slate, depending upon the specific crudes that are imported. Pressure distillate is the lighter of the two semi-refined products sent to Rodeo. It is mostly naphtha with some material in the kerosene and diesel boiling range. The raw naphtha, for example, can contain significant amount of pentane,[18] which would be recovered at Rodeo by the Propane Recovery Project. Naphtha, for example, is a feed to the proposed LPG[19] Recovery Unit at the Rodeo Refinery. Further, Santa Maria Refinery gas oil is a feed to various hydrocracking units at Rodeo that break it down into recoverable propane and butane feedstocks.

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[18] See, for example, Tesoro Material Safety Data Sheet, Naphtha; Available at: http://www.collectioncare.org/MSDS/naphthamsds.pdf.

[19] LPG = Liquefied Petroleum Gas = propane + butane.

The SMR Rail Spur Project RDEIR states that rail-imported crude oils would be sourced from oilfields throughout North America based on market economics and other factors. SMR Rail Spur Project RDEIR, pp. 1-4 & 2-22. The RDEIR identifies two tar sands crudes (RDEIR, pp. 2-3, 4.12-27, Tables 2.6 & 4.3.13, 4.7.14) and admits it has received another for about one year. SMR Rail Spur Project RDEIR pp. ES-14, 4.13-27, 2-31, 2-33, 5-3. While it asserts Bakken crudes will not be imported, the RDEIR does not contain any conditions that restrict the types of crudes that will be imported. Thus, the Santa Maria RDEIR should have evaluated the full range of potential cost-advantaged crudes that could be imported. The crudes that the RDEIR specifically identifies, plus other cost-advantaged crudes available in the market, would increase the amount of propane and butane that could be recovered at the Rodeo Refinery, compared to the SMR baseline. These various crudes are discussed below.

1. DilBit Tar Sands Crudes

The SMR Rail Spur Project RDEIR identifies Access Western Blend[20] and Peace River Heavy[21] as potential crudes that could be delivered via rail and processed at the Santa Maria Refinery. SMR Rail Spur Project RDEIR, pp. 2-3, 4.12-27, Tables 2.6 & 4.3.13, 4.7.14. The RDEIR also admits that SMR has received Canadian tar sands crude oil for about one year (post-baseline), specifically Kearl Lake, which made up 2% to 7% of the processed crude slate. SMR Rail Spur Project RDEIR pp. ES-14, 4.13-27, 2-31, 2-33, 5-3. The RDEIR also asserts that Bakken crudes will not be imported. However, the RDEIR does not contain any conditions that restrict the type of crudes that will be imported. Thus, the RDEIR should have evaluated the full range of potential cost-advantaged crude imported.

Most tar sands crudes are too heavy to flow in a pipeline and to be transported in the type of railcar proposed for the Project (*i.e.*, no steam coils or dedicated steaming facilities at Santa Maria), or unloaded and transferred to on-site storage tanks. Thus, they must be diluted or thinned with a lighter hydrocarbon stream to reduce viscosity. These diluted tar sands crudes are called "DilBits," which is a shorthand expression for blends of **diluent** and tar sands **bitumen**. All of the tar sands crudes mentioned in the RDEIR are DilBits. A DilBit typically contains 25% to 30%+ diluent. The diluent is typically natural gas condensate, pentanes, or naphtha.[22] Diluent presents two opportunities to increase the amount of propane and butane that could be recovered at Rodeo.

First, chemical composition data for the three tar sands crudes identified in the RDEIR indicates they are loaded with propanes and butanes. Peace River Heavy contains 0.83 vol% butanes and 7.05 vol% pentanes.[23] Access Western Blend contains 0.69 vol% butanes and

[20] http://www.crudemonitor.ca/crude.php?acr=AWB.

[21] http://www.crudemonitor.ca/crude.php?acr=PH.

[22] Gary R. Brierley, Visnja A. Gembicki, and Tim M. Cowan, Changing Refinery Configurations for Heavy and Synthetic Crude Processing, Available at: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7BA07DE342-E9B1-402A-83F7-36B18DC3DD05%7D&documentTitle=5639138.

[23] http://www.crudemonitor.ca/crude.php?acr=PH.

8.67% propanes.[24] Kearl Lake contains 0.83 vol% butanes and 10.2 vol% propanes.[25] Thus, it is indisputable that the targeted tar sands crude would contribute to the butane and propane that would be recovered by the Propane Recovery Project at Rodeo.

The SMR Rail Spur Project RDEIR alleges these butanes and propanes would be partitioned into the refinery fuel gas at SMR and thus would not reach the Rodeo Refinery. Most of the butane, present in much smaller amounts, could be partitioned to the fuel gas, depending on the temperature cut points of the distillation tower. However, most of the propane would remain in the straight run naphtha produced in the crude tower. SMR Rail Spur Project RDEIR, Fig. 2-10. Thus, the amount of butane and propane remaining in the semi-refined products headed to Rodeo, principally the pressure distillate, would be higher than in the baseline in which only heavy sour crudes were processed. SMR Rail Spur Project RDEIR, pp. 2-31. Further, operation of the crude tower could be modified to incorporate more of the propane and butane into the naphtha fraction.

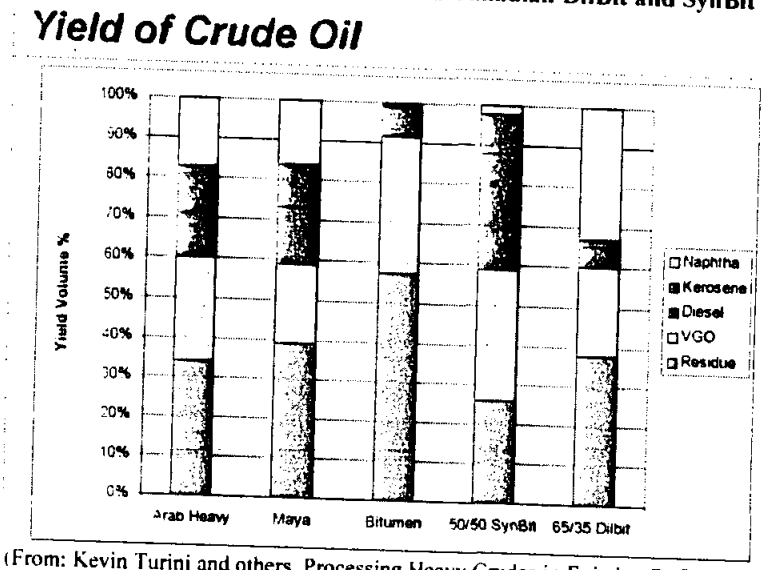
Second, DilBits, when refined, will yield much greater amounts of naphtha,[26] the lighter component of the pressure distillate sent to Rodeo and one of the feedstocks for propane recovery. Propane Recovery Project RDEIR, Fig. 3-6. The higher yield of naphtha from distilling DilBits, compared to heavy crudes, is illustrated in Figure 1. This bar chart compares the output of the distillation column (crude tower) for two commonly refined conventional heavy crudes (Arab Heavy and Maya, which are similar to the Santa Maria Refinery baseline crude slate) and three Canadian tar sands crudes (raw bitumen, SynBit, and DilBit). The last bar in Figure 1, 65/35 DilBit (65% bitumen, 35% diluent) is most similar to the crudes identified in the SMR Rail Spur Project RDEIR. Raw bitumen would be unlikely in large amounts without additional steam support at the proposed rail terminal. The SMR is not designed to refine SynBits so they also are unlikely imports.

[24] http://www.crudemonitor.ca/crude.php?acr=AWB.

[25] http://www.crudemonitor.ca/crude.php?acr=KDB.

[26] N. Yamaguchi, Tight Oil and Oil Sands in the U.S. Crude Slate: What Fuel Marketers Need to Know, Available at: http://fuelmarketernews.com/tight-oil-oil-sands-u-s-crude-slate-fuel-marketers-need-know/.

Figure 1
Distillation Yields of Conventional and Canadian DilBit and SynBit



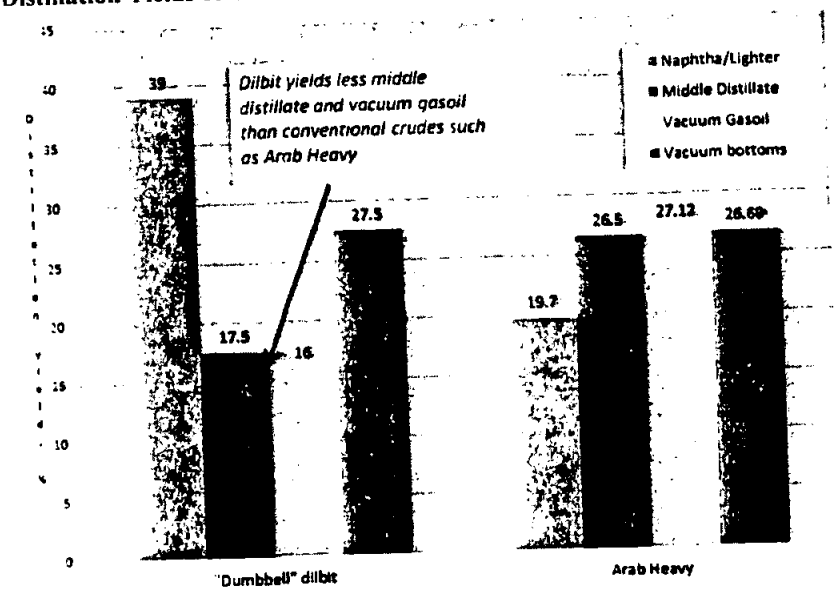
(From: Kevin Turini and others, Processing Heavy Crudes in Existing Refineries, Slides, 2011 AIChe Meeting, Chicago, IL

DilBits are sometimes referred to as "dumbbell" or "barbell" crudes as the majority of the diluent is C_5 to C_{12} and the majority of the bitumen is C_{30}+ boiling range material, with very little in between.[27] This means these crudes have a lot of material boiling at each end of the boiling point curve, but little in the middle. The 65/35 DilBit bar in Figure 1 indicates that these crudes generate about twice as much "naphtha" as the heavy crudes they would replace.

This is further confirmed by a different distillate yield bar chart from another source in Figure 2. This figure likewise confirms that switching from a heavy crude to a DilBit crude would roughly double the amount of naphtha distilled from the crude, from 19.7% to 39% and decrease gas oil from 27% to 16%. Additional amounts of both naphtha and gas oil would be produced by cracking the vacuum bottoms in the coker.

[27] Gary R. Brierley and others, Changing Refinery Configuration for Heavy and Synthetic Crude Processing, 2006; Available at: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7BA03DE342-E9B1-402A-83F7-36B18DC3DD05%7D&documentTitle=5639138.

Figure 2
Distillation Yields of a Conventional Heavy Crude (Arab Heavy) and DilBits



(from: Nancy Yamaguchi, Tight Oil and Oil Sands in the U.S. Crude Slate: What Fuel Marketers Need to Know, Fuel Marketer News; Available at: http://fuelmarketernews.com/tight-oil-oil-sands-u-s-crude-slate-fuel-marketers-need-know/

The DilBits yield very little middle distillate fuels, such as diesel, heating oil, kerosene, and jet fuel and more coke, than other heavy crudes. A typical DilBit, for example, will have 15% to 20% by weight light material, basically the added diluent, 10% to 15% middle distillate, and the balance, >75% is heavy residual material (vacuum gas oil and residue) exiting the distillation column. These characteristics, which distinguish DilBits from the current baseline crude slate, have two major implications.

First, refining of DilBits at SMR will generate more naphtha, the lighter semi-refined product, and less gas oil, thus changing the semi-refined product distribution. The increased amount of naphtha, when processed at the Rodeo Refinery, will generate more propane and butane. Naphtha, for example, is one of the feeds to the proposed LPG Recovery Unit. Propane Recovery Project RDEIR, Fig. 3-6. In other words, the increased amounts of naphtha produced from imported DilBit tar sands (or light tight crudes) would contain higher amount of propane and butane precursors, which would not be partitioned to refinery fuel gas at the Santa Maria Refinery as they would be present in the pressure distillate and refined at the Rodeo Refinery to recover butane and propane.

The Project proposes to import 37,142 bbl/day of cost-advantaged crudes by rail. The average baseline crude throughput for the Santa Maria Refinery (2010-2012) is 38,029 bbl/day. SMR Rail Spur Project RDEIR Table 2.7. Throughput data obtained from the SLOCAPCD indicates that this crude input generated 20,714 bbl/day of gas oil and 11,633 bbl/day of pressure distillate. Exhibit 5. Figures 1 and 2 indicate that DilBits could roughly double the amount of naphtha distilled from the crude oil. Assuming that all of the pressure distillate is naphtha, replacing 37,142 bbl/day of conventional heavy crudes with an equivalent amount of DilBit crude could increase naphtha yield from 11,633 bbl/day to 22,723 bbl/day (37,142/38,029 ×

11,633 × 2 = 22,723) in the baseline and significantly more once the SMR Throughput Project is operating at capacity. This significant increase in naphtha in the pressure distillate sent to Rodeo would allow the recovery of significant additional propane and butane at the Rodeo Refinery, relative to the baseline. This increase in naphtha in the pressure distillate would not exceed any tank vapor pressure limits as all of the tanks are operating far below their limit and the vapor pressure of the naphtha itself and the pressure distillate in which it is present are less than tank vapor pressure limits.

Second, the refining of DilBits at SMR will increase the amount of coke. This would increase emissions from coke dust and truck transport of coke, an impact not disclosed in the SMR Rail Spur Project RDEIR. This is further discussed in Comment III.

2. Other Tar Sand Crudes

The RDEIR also does not exclude the import of heavier tar sands crudes. In general, at refineries with cokers, such as Santa Maria Refinery, even decreases in API gravity (*i.e.*, heavier crude) can result in more propane and butane in the semi-refined products.[28]

3. Light Crudes

Finally, while the RDEIR asserts that Bakken crudes would not be imported (SMR Rail Spur Project RDEIR, pp. ES-5, 1-4, 2-1, 2-22), there are many other cost-advantaged light crudes that could be imported by rail. In general, the lighter the crude, the more butane and propane that can be recovered when it is refined.[29] These include new sources of cost-advantaged North American crudes, such as from the Permian (west Texas), Eagle Ford (south Texas), Granite Wash (Texas Panhandle), and Niobrara (Colorado) basins,[30] as well as Rocky Mountain Sweet (Casper, WY), and Mississippian Lime (Oklahoma).[31] Many of these crudes are already being refined by Phillips 66.[32] These crudes contain significant amounts of propane and butane and their precursors. The RDEIR does not exclude the rail import of any of these light, cost-advantaged crudes.

[28] NPC North American Resource Development Study, September 15, 2011, p. 18.

[29] See, *e.g.*, NPC North American Resource Development Study, Natural Gas Liquids (NGLs), September 15, 2011, p. 18; Available at: http://www.npc.org/prudent_development-topic_papers/1-13_ngl_paper.pdf.

[30] Dangerous Goods Transport Consulting, Inc., 2014, p. 23 (vol% C2 – C5 in Eagle Ford crude reported as 8.3%); Available at: composhttps://www.afpm.org/WorkArea/DownloadAsset.aspx?id=4229.

[31] Alan Mazaud, Exergy Resources, May 23, 2013, Pennsylvania Rail Freight Seminar, Slide: Growth of Domestic Production of Tight Oil.

[32] Phillips 66 Third Quarter Conference Call Slides, October 29, 2014; Available at: http://investor.phillips66.com/files/doc_presentations/2014/Earnings/PSX-Q3-News-Release-Slides-FINAL_v001_k94fx2.pdf.

4. Other Sources of Propane/Butane

The gas oils and naphthas sent to Rodeo would be further refined. This refining itself produces propane and butane. For example, the pressure distillate would be fed to hydrotreaters and hydrocrackers, which would produce propane- and butane-rich streams. The gas oils would be feed to cokers and hydrotreaters, which would also produce propane- and butane-rich streams. Thus, the increased amount of propane and butane that could be recovered when these semi-refined products generated from a lighter crude slate are further refined at Rodeo. Additional propane and butane could be generated at Rodeo itself by switching to a lighter crude slate.

D. Summary

In sum, the claims made in the RDEIRs in an attempt to decouple the Santa Maria Refinery Rail Spur Project and the Rodeo Refinery Propane Recovery Project based on vapor pressure limits have no merit. Some of the tanks have no vapor pressure limits at all, as vapors are recovered. All of the tanks operate far below their permitted vapor pressure limits. Further, the pipeline is operated to send semi-refined materials directly to Rodeo, without interim storage in pump station tanks along the pipeline. Even if semi-refined products had to be offloaded, their vapor pressures are far below permit limits. Thus, there is ample head room to increase the vapor pressure of semi-refined products shipped from Santa Maria to Rodeo.

III. EMISSIONS ARE UNDERESTIMATED

The SMR Rail Spur Project RDEIR estimated emissions from locomotives, fugitive emissions from railcars, pipeline components and crude oil storage tanks, a vapor recovery carbon canister, and vehicle traffic. SMR Rail Spur Project RDEIR, Sec. 4.3.4.2 & Appx. B. However, it omitted other sources of emissions, discussed below.

The SMR Rail Spur Project is proposing to replace the **majority** of the current crude slate (2010-2012: 38,100 bbl/day) with up to 100% tar sands crudes. The Project proposes to import 37,142 bbl/day of cost-advantaged crudes by rail. SMR Rail Spur Project RDEIR, p. 2-23. Thus, the Project would replace 97% of the baseline crude slate with up to 100% tar sands crude. The Throughput Increase Project will increase the crude permit level to 48,950 bbl/day. SMR Throughput Increase FEIR, p. 1-1. Thus, at full buildout, up to 76% of the crude slate will be different crudes than in the baseline, potentially 100% tar sands crudes. These new crudes have many chemical and physical properties that distinguish them from the baseline crude slate and that will result in impacts that were not evaluated in the SMR Rail Spur Project RDEIR. These were discussed for both tar sands and light crudes in my previous comments in Exhibits 2 and 3, which are incorporated here by reference.

A. Emission Changes Due To Changes in Fuel Gas Composition

The SMR Rail Spur Project RDEIR asserts that if significant amounts of propane and butane were present in the imported crudes, as discussed in Comment II, they would be partitioned into the Santa Maria refinery fuel gas. Assuming, *arguendo*, that this is correct, it

would significantly increase the heat content of the refinery fuel gas. This would have several impacts. First, combustion temperatures would be higher in all heaters and boilers, as propane and butane burn with a hotter flame than natural gas and baseline refinery fuel gas, not enriched with propane and butane.[33] This would increase emissions nitrogen oxides (NOx) from all refinery fuel gas fired sources, compared to the baseline. Second, propane and butane have higher GHG global warming potentials than other components in refinery fuel gas.[34] Thus, greenhouse gas emissions from all heaters and boilers would increase. Finally, the significant increase in heat content may require modification or replacement of existing burner in heaters and boilers. None of these impacts were addressed in the SMR Rail Spur Project RDEIR.

B. Increased Combustion Emissions from Tar Sands Bitumen Not Evaluated

The SMR Rail Spur Project RDEIR indicates that tar sands crudes will be imported. The composition of tar sands crudes is chemically different from other heavy crudes currently processed at the SMR as they are tar sands bitumen mixed with diluent. They are unique for two major reasons: (1) presence of large quantities of volatile diluent full of reactive organic gases (ROG) and toxic chemicals as discussed above and (2) unique chemical composition of the bitumen, the heavy fraction. The previous comment discussed diluent, which will modify the composition of the both the semi-refined products sent to the Rodeo Refinery and the SMR refinery fuel gas. This comment discusses the unique composition of tar sands bitumens that require more intense processing and thus result in higher emissions.

Tar sands bitumens are composed of higher molecular weight chemicals and are deficient in hydrogen compared to conventional heavy crudes. This means more energy will be required and more emissions produced to convert them into the same slate of semi-refined and refined products. More energy will be required to add hydrogen and break the bonds of the larger molecules.

The SMR Rail Spur Project RDEIR concedes the hydrogen point. However, the SMR Rail Spur Project RDEIR argues that hydrogen addition occurs at the Rodeo Refinery, not at the Santa Maria Refinery, and thus did not include these emissions. SMR Rail Spur Project RDEIR, pp. 4.3-69/70. However, as explained in my comments in Exhibits 2 and 3 and comments by others on the SMR Rail Spur Project RDEIR (Pless 2014[35]; Karras 2014), the Rodeo Refinery Propane Recovery Project and the SMR Rail Spur Project should have been evaluated under CEQA as a single project as they depend on each other. Thus, the increase in emissions of criteria pollutants and greenhouse gases from most fired sources due to tar sands bitumen derived semi-refined products refined at the Rodeo Refinery should have been included in the emission inventory for the SMR Rail Spur Project.

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[33] Flame Temperatures of Some Common Gases; Available at: http://www.engineeringtoolbox.com/flame-temperatures-gases-d_422.html.

[34] See, *e.g.*, http://www.epa.gov/climateleadership/documents/emission-factors.pdf.

[35] Letter from Petra Pless to Laura Horton, Re: *Review of the Phillips 66 Company Rail Spur Extension and Crude Unloading Project Revised Public Draft Environmental Impact Report and Vertical Coastal Access Project Assessment*, November 21, 2014.

The Rodeo Refinery RDEIR is silent as to other crude quality factors that will increase emissions at Rodeo. Canadian tar sands bitumen is distinguished from conventional petroleum by the small concentration of low molecular weight hydrocarbons and the abundance of high molecular weight polymeric material.[36] Crudes derived from Canadian tar sands bitumen – DilBits, SCOs and SynBits – are heavier, *i.e.*, have larger, more complex molecules such as asphaltenes and resins,[37] some with molecular weights above 15,000.[38] They are the nonvolatile fractions of petroleum and contain the highest proportions of sulfur, nitrogen, and oxygen.[39] They have a marked effect on refining and result in the deposition of high amounts of coke during thermal processing in the coker, which would occur at the Santa Maria Refinery. They require more intense processing in the coker to break them down into lighter products.

These differences are not reflected in any of the lumper parameters (API gravity, vacuum resid percentage, sulfur, TAN) presented in the SMR Rail Spur Project RDEIR. SMR Rail Spur Project Table 4.3-13 and p. 4.3-70. These differences mean that the coker at the Santa Maria Refinery will have to work harder to convert vacuum bottoms from distilling tar sand crude into gas oil, which will increase combustion emissions of NOx, sulfur oxides (SOx), carbon monoxide (CO), ROG, particulate matter with an aerodynamic diameter of 10 and 2.5 micrometers or less (PM10 and PM2.5), and greenhouse gases (GHGs). These increases in emissions were not included in the emission inventory.

C. Increased Metal Content from Tar Sands Were Not Evaluated

The Project could increase the import of heavy sour tar sands crude by up to 76% of the entire permitted capacity of the Santa Maria Refinery, once the SMR Throughput Project is fully operational. These crudes have higher metal content than the baseline crude slate.[40] This represents a significant increase in a type of crude that will increase emissions compared to the

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[36] O.P. Strausz, The Chemistry of the Alberta Oil Sand Bitumen; Available at: http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22_3_MONTREAL_06-77_0171.pdf.

[37] Asphaltenes are nonvolatile fractions of petroleum that contain the highest proportions of heteroatoms, i.e., sulfur, nitrogen, oxygen. The asphalt fraction is that portion of material that is precipitated when a large excess of a low-boiling liquid hydrocarbon such as pentane is added. They are dark brown to black amorphous solids that do not melt prior to decomposition and are soluble in benzene and aromatic naphthas.

[38] O.P. Strausz, The Chemistry of the Alberta Oil Sand Bitumen; Available at: http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22_3_MONTREAL_06-77_0171.pdf.

[39] James G. Speight, The Desulfurization of Heavy Oils and Residua, Marcel Dekker, Inc., 1981, Tables 1-1, 2-2, 2-3, 2-4 and p. 13 and James G. Speight, Synthetic Fuels Handbook: Properties, Process, and Performance, McGraw-Hill, 2008, Tables A.2, A.3, and A.4.

[40] Straatiev and others, 2010, Table 1; Brian Hitchon and R.H. Filby, Geochemical Studies - 1 Trace Elements in Alberta Crude Oils; http://www.ags.gov.ab.ca/publications/OFR/PDF/OFR_1983_02.PDF; F.S. Jacobs and R.H. Filby, Trace Element Composition of Athabasca Tar Sands and Extracted Bitumens, Atomic and Nuclear Methods in Fossil Energy Research, 1982, pp 49-59; James G. Speight, The Desulfurization of Heavy Oils and Residua, Marcel Dekker, Inc., 1981, Tables 1-1, 2-2, 2-3, 2-4 and p. 13 and James G. Speight, Synthetic Fuels Handbook: Properties, Process, and Performance, McGraw-Hill, 2008, Tables A.2, A.3, and A.4; Pat Swafford, Evaluating Canadian Crudes in US Gulf Coast Refineries, Crude Oil Quality Association Meeting, February 11, 2010; Available at: http://www.coqa-inc.org/20100211_Swafford_Crude_Evaluations.pdf .

current Refinery slate. The impacts from this change were not evaluated in the SMR Rail Spur Project RDEIR.

The U.S. Geological Survey (USGS) reported that "natural bitumen," the source of all Canadian tar sands-derived oils, contains 102 times more copper, 21 times more vanadium, 11 times more sulfur, six times more nitrogen, 11 times more nickel, and 5 times more lead than conventional heavy crude oil, such as those currently refined from local sources.[41] The SMR Rail Spur Project RDEIR reported vanadium and nickel concentration in a current "typical crude blend" compared to two potential tar sands crudes. SMR Rail Spur Project RDEIR, Table 4.3-13. This comparison shows that the vanadium concentration in Access Western Blend (190 ppmw) and Peak River Heavy (167 ppmw) are higher than the upper end of the range of major baseline crude sources. The SMR Rail Spur Project RDEIR is silent as to the significance of this reported increase in vanadium. The SMR Rail Spur Project RDEIR did not present any data for any other metal, known to be elevated in tar sands crudes.

The environmental damage caused by these metal pollutants includes bioaccumulation of toxic chemicals up the food chain and a direct health hazard from air emissions. These metals, for example, mostly end up in the coke. Thus, higher levels of metals will be present in the coke dust and coke pile runoff/seepage. The SMR Rail Spur Project DEIR indicated that "[m]etals that are present in coke have been detected in groundwater at concentrations above the California Department of Health maximum contamination levels (MCL) in the area around the coke pile runoff area..." SMR Rail Spur Project DEIR, p. 4.7-39/40. This statement has vanished from the SMR Rail Spur Project RDEIR. Thus, a switch to tar sands crude could contribute to this existing significant impact from the coke pile, which was not disclosed in the SMR Rail Spur Project RDEIR.

Further, larger amounts of coke may be produced by the tar sands crudes than the current crude slate. The metal content of fugitive dust from coke piles could increase to dangerous levels. The California Air Resources Board, for example, has classified lead as a pollutant with no safe threshold level of exposure below which there are no adverse health effects. Thus, just the increase in lead from switching to tar sands crude is a significant impact that was not disclosed in the SMR Rail Spur Project RDEIR. Accordingly, crude quality is critical for a thorough evaluation of the impacts of a crude switch as facilitated by rail import to the SMR.

[41] R.F. Meyer, E.D. Attanasi, and P.A. Freeman, Heavy Oil and Natural Bitumen Resources in Geological Basins of the World, U.S. Geological Survey Open-File Report 2007-1084, 2007, p. 14, Table 1; Available at http://pubs.usgs.gov/of/2007/1084/OF2007-1084v1.pdf.

D. Sump Emissions Were Omitted

Unloading facilities generally include liquid spill containment sumps with the capacity to contain the contents of at least one tank car. Crude oil that spills into these sumps would release vapors including ROG, which are ozone precursors, and toxic air contaminant (TAC) emissions. The RDEIR is silent as to sumps and their emissions.

E. Rail Car Fugitive Emissions Were Omitted

ROG and TACs are emitted from rail cars from their point of origin through unloading as rail cars are not vapor tight. The SMR Rail Spur Project RDEIR did not include these emissions.

The crude oil would be shipped in tank cars, such that the volume of loaded crude oil shipped is less than the capacity of the rail car to accommodate expansion during shipping. This volume reduction creates free space at the top of the tank car, which provides space for entrained gases, such as those from diluent, to be released from the crude oil[42] and emitted to the atmosphere during transit and idling in rail yards.[43]

As rail cars are not vapor tight, these vapors in the head space above the oil are emitted to the atmosphere during rail transport and at the unloading terminal. The vapor in the headspace can flash during transport, when temperature increases or pressure drops, causing valves to open, emitting ROG and TACs.

These losses are consistent with the well-known "crude shrinkage" issue associated with crude by rail. The crude delivered is significantly less than the crude loaded. The reported range in crude shrinkage is 0.5% to 3% of the loaded crude.[44] Some of this shrinkage is likely due to emissions from the rail car during transit. The emissions of ROG and TACs from rail cars has been confirmed by field measurements.[45] The SMR Rail Spur Project RDEIR did not include these ROG and TAC emissions in its emission calculations or the health risk assessment.

Tank cars have domes to allow space for the product to expand as temperatures rise. Each dome has a manhole through which the tank car can be loaded, unloaded, inspected, cleaned, and repaired. Dome covers may be hinged and bolted on or screwed on. Most domes

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[42] Anthony Andrews, Congressional Research Service, Crude Oil Properties Relevant to Rail Transport Safety: In Brief, February 18, 2014, pp. 8-9.

[43] A DOT 111 (or comparable) tank car generally has a capacity of 34,500 gallons or 263,000 lbs. gross weight on rail. Under some conditions, the maximum gross weight can be increased to 286,000 lbs. At an API gravity of 50°, a tank car can hold its maximum volume of 31,800 gallons and not exceed the 286,000 lb gross weight on rail limit. As the API gravity drops, the amount of oil that can be carried must also drop. Thus, a tank car of Bakken crude, at its highest density of 39.7° API, can only hold 30,488 gallons, a volume reduction of about 1,300 gallons. Further, as crude oil density (and thus API gravity) is temperature dependent, volume will increase as temperature increases. Thus, the shipper may have to reduce the shipped volume even further. This volume reduction creates a space above the crude oil where vapors accumulate.

[44] Alan Mazaud, Exergy Resources, Pennsylvania Rail Freight Seminar, May 23, 2013, p. 17. Available at: http://www.parailseminar.com/site/Portals/3/docs/Alan%20Mazaud%20Presentation%20-%20AM.pptx

[45] http://www.youtube.com/watch?v=35uC1gLetnw.

have vents and safety valves to let out vapors.[46] Thus, they are sources of ROG emissions that were omitted from the emission calculations. Further, when dome covers are left open, any residual vapors escape to atmosphere. Residual material clings to the bottom and sides of empty rail cars and emits ROG and TACs while the rail cars idle at the site, waiting for the entire unit train to be unloaded. Open covers are common in rail yards as they are opened for inspections and repairs. The ROG and TAC emissions from these sources were not included in the SMR Rail Spur Project RDEIR's emission inventory.

Further, each tank car has a bottom outlet which is used for loading and unloading that includes pumps, manifolds, and valves, all of which leak ROG and TACs. Finally, liquid leaks occur when unloading arms are disconnected, even with state-of-the-art no leak arms. These disconnect leaks evaporate, contributing to ROG and TAC emissions.

An estimate of these emissions can be based conservatively on the lower end of the range of crude shrinkage (0.5%) discussed above and the maximum freight weight per car of 106 tons from the TRN Spec Sheet-1. Assuming 80 cars/train and five unit trains per week (SMR Rail Spur Project RDEIR, p. ES-5), a total of 30 ton/day[47] of ROG can be emitted as the trains travels from Canada to the Santa Maria Refinery rail terminal. The distance travelled outside of California was not reported, but is estimated to be about 1500 miles. The distance within California, on the longest route, is estimated as 300 miles one way. SMR Rail Spur Project RDEIR, p. B-9. Thus, about 17% of the 30 ton/day of ROG would be emitted in California or about 5 ton/day of ROG (10,000 lb/day) can be emitted within California from rail car leakage.[48] Of the 300 miles within California, 67 miles are within the boundary of the SLOCAPCD via the northern route. SMR Rail Spur Project RDEIR, p. B-9. Thus, 1.1 ton/day (2,200 lb/day) of ROG emissions can be emitted within the SLOAPCD from rail car leakage.[49] These daily emissions greatly exceed the SLOCAPCD daily ROG+NOx CEQA significance threshold of 25 lb/day (RDEIR, Table 4.3-17), requiring additional mitigation not identified in the RDEIR. These ROG emissions could be reduced by modifying the rail cars before they are shipped to minimize or eliminate leakage.

These ROG emissions contain the same chemicals found in the crude oil, including benzene, toluene, ethylbenzene, and xylene (collectively "BTEX") and hexane. Some crudes can contain up to 7% benzene by weight. Thus, greater than 154 lb/day of benzene could be emitted in California from rail car leakage. This rail car leakage is much greater than the amount of benzene (and other TACs) included in the SMR Rail Spur Project RDEIR's health risk assessment.

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[46] Chapter 11. Tank Car Operations, Available at: http://www.globalsecurity.org/military/library/policy/army/fm/10-67-1/CHAP11.HTML.

[47] ROG emissions from train transit = (106 ton/car)(80 car/train)(5 train/week)(0.005)/(7 days/week) = **30 ton/day.**

[48] ROG emitted within California = (30 ton/day)(300/1500+300) = **5 ton/day.**

[49] ROG emitted within SLOCAPCD = (30 ton/day)(67/1500+300) = **1.1 ton/day.**

IV. THE SMR RAIL SPUR PROJECT RDEIR DID NOT EVALUATE THE INCREASE IN RISK OF ACCIDENTS AT THE SANTA MARIA REFINERY

The SMR Rail Spur Project RDEIR includes a brief discussion of the impact of changes in crude slate on hazards at the Refinery, designated as Impact #HM.3. SMR Rail Spur Project RDEIR pp. 4.7-63 and 4.7-65. This discussion touches on naphthenic acid corrosion, pointing to various inspection programs and ultimately dismissing corrosion-related accidents because "... the expected range of sulfur and TAN would be within the range of the crudes that are currently being processed at the SMR. Therefore, the change in crude slate would not be expected to change the sulfur or TAN levels compared to the crude sources that are currently being processed at the SMR." SMR Rail Spur Project RDEIR, Table 4.7-14 and p. 4.7-66. This is an inadequate discussion and the conclusions are wrong for several reasons.

First, corrosion failures in refineries are of great concern because of the high likelihood of "blowout" or catastrophic failure of components. This can happen because corrosion occurs at a relatively uniform rate over a broad area, so a pipe can get progressively thinner until it bursts, rather than leaking at a pit or local thin area that could be found during visual inspections. The process fluids carried in these lines are often above their auto-ignition temperature, resulting in large fires. They also usually carry toxic and hazardous materials, such as sulfur compounds (hydrogen sulfide, mercaptans, benzene) that can lead to toxic clouds, which can have significant adverse effects on surrounding communities.

Second, as background, it is important to recognize that the Rail Spur Project is proposing to replace the **majority** of the current crude slate (38,100 bbl/day) with up to 100% tar sands crudes. The Project proposes to import 37,142 bbl/day of cost-advantaged crudes by rail. SMR Rail Spur Project RDEIR, p. 2-23. Thus, the Project would replace 97% of the baseline crude slate with up to 100% tar sands crude. The SMR Throughput Increase Project will increase the crude permit level to 48,950 bbl/day. SMR Throughput Increase Project FEIR, p. 1-1. Thus, at full buildout, up to 76% of the crude slate will be different crudes than in the baseline, potentially 100% tar sands crudes.

Third, tar sands crudes have high Total Acid Numbers (TAN),[50] which indicates high organic acid content, typically naphthenic acids. Naphthenic acid attack occurs primarily in crude units and vacuum units, such as those at the SMR. SMR Rail Spur Project RDEIR, Fig. 2-10. They also form sludge and gum which can block pipelines and pumps. However, some acids are relatively inert. Thus, the TAN number does not always represent the true corrosive properties of a crude oil. Further, different acids will react at different temperatures, making it difficult to determine which processing units may be affected. As a rule-of-thumb, crude oils with a TAN number greater than 0.5 mg KOH/g are considered to be potentially corrosive and indicates a level of concern. A TAN number greater than 1.0 mg KOH/g is considered to be very high.[51] Canadian tar sands crudes are very high TAN crudes. The DilBits,

[50] The Total Acid Number measures the composition of acids in a crude. The TAN value is measured as the number of milligrams (mg) of potassium hydroxide (KOH) needed to neutralize the acids in one gram of oil.

[51] Margaret Sheridan, California Crude Oil Production and Imports, Staff Paper, California Energy Commission, April 2006, p. 6; Available at: http://www.energy.ca.gov/2006publications/CEC-600-2006-006/CEC-600-2006-006.PDF.

for example, range from 0.98 to 2.42 mg KOH/g.[52] The Project is proposing to import crudes at the upper end of this range (SMR Rail Spur Project RDEIR, Table 4.7.14), far above the level of concern and far above the "typical crude blend" refined at SMR in the baseline. SMR Rail Spur Project RDEIR, Table 4.7-14. Thus, the RDEIR should have included a detailed analysis of the corrosion potential of the proposed crude slate and imposed mitigation.

Further, while the industry benchmark for TAN corrosion is 0.5, crudes with lower TANs can still cause significant corrosion problems, depending upon the specific acids. Sweet low TAN crudes, such as those currently flooding the market, and which could be imported by the Rail Spur Project, are also known to cause TAN corrosion.[53] The SMR Rail Spur Project RDEIR is silent on corrosion issues related to these crudes.

Fourth, each crude has its own unique characteristic chemistry and thus effects on corrosion. Refineries that process a consistent diet of a particulate crude or crude blend can base future predictions of corrosion potential on past experience. However, when a major switch in crude slate occurs, as proposed here, predicting future corrosion based on historic operating ranges or "typical crude blends", as in the SMR Rail Spur Project RDEIR, is not reliable. A new slate, even when major lumper parameters are in the historic range, minimizes the accuracy, or even the feasibility of predictions based on historic data.[54]

The rationale that sulfur levels and TAN of the crude slate would stay within the reported range and thus corrosion is not an issue, ignores the possibility of gradual creep in both sulfur and TAN within the usual range that could still be significant. The SMR Rail Spur Project RDEIR, for example, concedes that the new crude slate would increase sulfur by 0.8%. SMR Rail Spur Project RDEIR, p. 4.3-46. From a corrosion standpoint, this is a significant increase. The SMR Rail Spur Project RDEIR did not discuss the impact of a 0.8% increase in sulfur on corrosion-induced accidents at the SMR.

The high proportion of tar sands crudes in the future crude slate renders the ranges in SMR Rail Spur Project RDEIR Table 4.7-14 as irrelevant for concluding that the new crudes fall within the range of historic crudes. For example, if 100% Peace River Heavy[55] were refined, both its average sulfur and TAN level would exceed the sulfur (5.0%>4.2%) and TAN (2.5>1.0 mg KOH/g) concentrations in the baseline "typical crude blend." In fact, even the lower end of the reported range of sulfur and TAN in Peace River Heavy would exceed the "typical crude blend." The fact that the sulfur and TAN of Peace River Heavy falls within the reported ranges (S: 2.1 to 5.2%; TAN: 0.4-4.0 mg KOH/g) is simply irrelevant, as the SMR did not operate, on average, at the upper end of the range. Because the sulfur and TAN data for

[52] www.crudemonitor.ca.

[53] M.J. Nugent, J.D. Dobis, Experience with Naphthenic Acid Corrosion in Low TAN Crudes, Corrosion 98, Paper No. 577

[54] See discussion in API Recommended Practice 939-C, Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failure in Oil Refineries, First Edition, May 2009.

[55] Access Western Blend (TAN: 1.69-1.85 mg KOH/g; S: 3.94-3.96%); http://www.crudemonitor.ca/crude.php?acr=AWB and Peace River Heavy (TAN: 2.42 to 2.58 mg KOH/g; S: 4.94 to 5.08%); http://www.crudemonitor.ca/crude.php?acr=PH.

these tar sands crudes exceed the "typical crude blend" by significant amounts, corrosion impacts are significant and should have been disclosed, analyzed, and mitigated.

Fifth, the SMR Rail Spur Project RDEIR did not discuss or even mention sulfidation corrosion, which is a concern for refineries such as SMR, built in 1955 before current American Petroleum Institute (API) standards were developed to control corrosion and before piping manufacturers began producing carbon steel in compliance with current metallurgical codes. Rather, it notes in passing that "[h]igh sulfur levels can lead to sulfide related corrosion." SMR Rail Spur Project RDEIR, p. 4.7-65.

The early construction date suggests the metallurgy used throughout much of the SMR may not be adequate to handle the unique chemical composition of tar sands crudes without significant upgrades. There is no assurance that required metallurgical upgrades would occur if tar sands crudes dominate the crude slate, as they are very expensive and are not required by any regulatory framework. Experience with changes in crude slate at the Chevron Refinery in Richmond in the San Francisco Bay Area suggest required metallurgical upgrades are ignored, leading to catastrophic accidents.[56]

Sulfidation corrosion generally occurs above about 500 F for carbon steel pipe and above about 600 F for 5 Cr low-alloy steel. Some sulfide species are more corrosive than others, including mercaptans, hydrogen sulfide, and disulfides, all of which occur at elevated levels in tar sands crudes. Sulfidation corrosion manifests as uniform thinning and thus cannot be detected from visual inspections. Low silicon carbon steel can corrode 2 to 10 times faster than higher silicon carbon steel.[57]

How much low silicon carbon steel piping is present at SMR? What impact will an admitted 0.8% increase in sulfur have on this piping? What sulfur compounds are present in the 0.8% increase in sulfur? The SMR Rail Spur Project RDEIR did not disclose either the specific suite of sulfur compounds in the proposed imports or the metallurgy and operating conditions in the units potentially susceptible to sulfidation corrosion. Thus, it fails as an informational document under CEQA.

A catastrophic blowout due to sulfur creep recently occurred at the Chevron Richmond Refinery near the Rodeo Refinery. This refinery gradually changed crude slates, while staying within its established crude unit design basis for total weight percent sulfur of the blended feed to the crude unit.[58] This change increased corrosion rates in the 4-sidecut line, which led to a

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[56] U.S. Chemical Safety and Hazard Investigation Board, Interim Investigation Report, Chevron Richmond Refinery Fire, Chevron Richmond Refinery, Richmond, California, August 6, 2012, Draft for Public Release, April 15, 2013: Available at: http://www.csb.gov/chevron-refinery-fire/.

[57] E.H. Niccolls, J.M. Stankiewicz, J.E. McLaughlin, and K. Yamamoto, High Temperature Sulfidation Corrosion in Refining, September 2008, 17th International Corrosion Congress, Corrosion Control in the Service of Society, Vol. 1 of 5, as cited in: Interim Investigation Report, Chevron Richmond Refinery Fire, August 6, 2012; Available at: http://www.csb.gov/assets/1/19/Chevron_Interim_Report_Final_2013-04-17.pdf.

[58] US Chemical Safety and Hazard Investigation Board, Chevron Richmond Refinery Pipe Rupture and Fire, August 6, 2012, p.34 ("While Chevron stayed under its established crude unit design basis for total wt. % sulfur of

catastrophic pipe failure in the #4 Crude Unit on August 6, 2012. This accident sent 15,000 people from the surrounding area for medical treatment due to the release and resulting fire that created huge black clouds of pollution billowing over the surrounding community and across the San Francisco Bay.[59]

The SMR has a similar crude unit, identified as the "crude tower" in SMR Rail Spur Project RDEIR Figure 2-10. These types of accidents can be reasonably expected to result from incorporating tar sands crudes into the Santa Maria Refinery crude slate, even if the range of sulfur and TAN of the crudes remain the same, unless significant upgrades in metallurgy occur, as these crudes have a significant concentrations of sulfur in the heavy components of the crude coupled with high total acid numbers (TAN) and high solids, which aggravate corrosion. A crude slate change could result in corrosion from, for example, the particular suite of sulfur compounds or naphthenic acid content, that leads to significant accidental releases, even if the crude slate is within the current design slate basis, due to compositional differences. The gas oil and vacuum resid piping, for example, may not be able to withstand naphthenic acid or sulfidation corrosion from refining 76% to 97% tar sands crudes, leading to catastrophic releases.[60]

Elevated levels of TAN and sulfur can cause accidents that result in catastrophic releases of air pollution. Such releases were not considered in the SMR Rail Spur Project RDEIR. Rather, the SMR Rail Spur Project RDEIR relies on the SMR's existing Process Safety Management program, including the Management of Change (MOC) and Mechanical Integrity (MI) programs, to prevent corrosion. SMR Rail Spur Project RDEIR, pp. 4.7-65/66. However, these programs were also in place at the Chevron Richmond Refinery (and many other similarly afflicted refineries) at the time of the August 2012 accident discussed above. They did not prevent a catastrophic accident caused by sulfur (or TAN) creep. The recent Chevron Refinery Modernization Project FEIR incorporated many additional mitigation measures to improve these programs,[61] which should be required for the Santa Maria Refinery to mitigate the increase in sulfur and TAN in crudes imported by the Rail Spur Project.

Refinery emissions released in upsets and malfunctions can, in some cases, be greater than total operational emissions recorded in formal inventories. For example, a recent investigation of 18 Texas oil refineries between 2003 and 2008 found that "upset events" were

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the blended feed to the crude unit, the sulfur composition significantly increased over time. This increase in sulfur composition likely increased corrosion rates in the 4-sidecut line.").

[59] U.S. Chemical Safety and Hazard Investigation Board, Interim Investigation Report, Chevron Richmond Refinery Fire, Chevron Richmond Refinery, Richmond, California, August 6, 2012, Draft for Public Release, April 15, 2013, Available at: http://www.csb.gov/chevron-refinery-fire/.

[60] See, for example, K. Turini, J. Turner, A. Chu, and S. Vaidyanathan, Processing Heavy Crudes in Existing Refineries. In: Proceedings of the AIChe Spring Meeting, Chicago, IL, American Institute of Chemical Engineers: New York, NY, Available at: http://www.aiche-ipd.org/listing/112.pdf.

[61] See, for example, Chevron Refinery Modernization Project, Revisions to Draft EIR Volumes 1 and 2, p. 4-40, Mitigation Measure 4.13-7h, Available at: http://chevronmodernization.com/project-documents/.

frequent, with some single upset events producing more toxic air pollution than what was reported to the federal Toxics Release Inventory database for the entire year.[62]

Catastrophic releases of air pollution from these types of corrosion-caused accidents were not considered in the SMR Rail Spur Project RDEIR and are significant. Mitigation should be imposed, including at least the following:

- All mitigation measures required in the Chevron Refinery Modernization Project FEIR;
- 100% component inspection of all carbon steel piping systems susceptible to sulfidation corrosion; and
- Modification of work processes for review of damage mechanisms for processes covered by the Process Safety Management standard to conform with the American Petroleum Institute Recommended Practice 571, Damage Mechanisms Affecting Fixed Equipment in the Refining Industry. The revised work processes shall require consideration of damage mechanism reviews as part of the Process Hazard Analysis process.[63]

V. RAIL ACCIDENTS WERE UNDERESTIMATED AND ARE SIGNIFICANT

The RDEIR evaluated "potential public safety and hazardous materials impacts" from train derailments and unloading accidents that could lead to fires and explosions. RDEIR, Sec. 4.7. Elsewhere, the RDEIR evaluates the impacts of derailments on water resources and biological resources. RDEIR, Secs. 4.4 & 4.13. These analyses are fundamentally flawed and incomplete, as explained below.

First, the RDEIR only analyzed impacts from the Roseville and Colton Rail Yards to the Project site. It did not analyzed impacts from the California border to these rail yards, arguing that trains could enter California at five different locations and thus the specific route was "speculative". RDEIR, pp. 4.7-1; 4.13-7. Routes are not "speculative" when they are known, as here. The trains can take any of them, depending on conditions. As they are known and any of these known routes can be taken, they are not speculative. The RDEIR should have evaluated all of them. Further, the trains can take multiple routes from the rail yards to the Santa Maria Rail Yard. The RDEIR, inconsistently, did not conclude that this rendered these routes speculative.

This is a serious omission as the segments from the state line to the rail yards pass through some of the state's most sensitive ecological areas and parallel the water supply for most of the state. These route segments also contain many high hazard areas for derailments.

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[62] J. Ozymy and M.L. Jarrell, Upset over Air Pollution: Analyzing Upset Event Emissions at Petroleum Refineries, Review of Policy Research, v. 28, no. 4, 2011.

[63] Terms and Conditions of Probation, People v. Chevron U.S.A. Inc., Superior Court of the State of California, County of Contra Costa, Case No. 1-162745-4.

Emergency response teams have generally good coverage in the urban areas, but none are located near the high hazard areas in rural Northern California that the RDEIR did not analyze.[64]

Second, the RDEIR did not analyze a worst case derailment. The RDEIR assumed a worst-case spill of 180,000 gallons, or about six tanker cars. RDEIR, p. 4.7-47. No support was provided for this choice. Rail accident records should have been reviewed to select a worst-case spill. The July 2013 Lac-Mégantic derailment spilled about 1.6 million gallons of Bakken crude oil, or about 53 railcars, covering an area of 77 acres.[65] The RDEIR should have based its analysis on a spill of at least 1.6 million gallons.

Third, the RDEIR did not analyze the impacts of a derailment on the state's water supply, which originates in the northern portion of the state along the rail segments eliminated from its analysis as "speculative". The rail routes from the state line to the rail yards parallel major rivers, such as the Sacramento, Yuba, Feather and American Rivers, which supply most of the water used throughout the state, distributed by a complex system of reservoirs and pipelines operated by Central Valley Project and the State Water Project. A significant spill of crude oil into any of these rivers would potentially shutdown the water supply for a significant portion of the state. This would have catastrophic and far reaching consequences that the RDEIR does not acknowledge, let alone analyze.

Fourth, the RDEIR notes that when spilled, a DilBit will sink (RDEIR, 4.13-27), but the RDEIR fails to disclose the resulting consequences on water supply and biological resources. The RDEIR is also silent on the difficulty of cleaning up the spill. An oil pipeline burst near Marshall, Michigan in July 2010, spilling a million gallons of DilBit in the Kalamazoo River. This spill decimated Talmadge Creek, a tributary to the Kalamazoo River, and about 40 miles of the river, prompting a more than $1 billion cleanup that, four years later, is still under way.[66] While most conventional crudes float on water, most of the DilBit, the bitumen component, sinks and clings to bottom sediments. This submerged oil is significantly harder to cleanup. The Kalamazoo spill, which occurred in 2010, is still not cleaned up.[67] The RDEIR failed to disclose

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[64] Interagency Rail Safety Working Group, State of California, Oil by Rail Safety in California. Preliminary Findings and Recommendations, June 10, 2014.

[65] NTSB, Safety Recommendation In reply refer to: R-14-4 through -6; January 21, 2014. Available at: http://www.ntsb.gov/doclib/recletters/2014/R-14-004-006.pdf.

[66] Keith Matheny, Environmental Disasters Lurk in Energy Pipelines, Detroit Free Press, October 12, 2014. Available at: http://www.freep.com/story/money/business/michigan/2014/10/12/energy-environmental-threats/17046063/.

[67] A Dilbit Primer: How It's Different from Conventional Oil, Inside Climate News. Available at: http://insideclimatenews.org/news/20120626/dilbit-primer-diluted-bitumen-conventional-oil-tar-sands-Alberta-Kalamazoo-Keystone-XL-Enbridge?page=show; Lindsey Smith, 3 Years and Nearly $1 Billion Later, Cleanup of Kalamazoo River Oil Spill Continues, Michigan Radio, July 25, 2013. Available at: http://michiganradio.org/post/3-years-and-nearly-1-billion-later-cleanup-kalamazoo-river-oil-spill-continues; NOAA Office of Response and Restoration, As Oil Sands Production Rises, What Should We Expect at Diluted Bitumen (Dilbit) Spills?, Available at: http://response.restoration.noaa.gov/about/media/oil-sands-production-rises-what-should-we-expect-diluted-bitumen-dilbit-spills.html; Witt O'Brien, A Study of Fate and Behavior of Diluted Bitumen Oils on Marine Waters, November 2013. Available at: http://www.transmountain.com/uploads/papers/1391734754-astudyoffateandbehaviourofdilutedbitumenoilsonmarinewater.pdf

the difficulty of cleaning up a large spill in one of California's headwater rivers that supply California's municipal, industrial, and agricultural water.

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Tuesday, September 03, 2013 2:05 PM
To: Janice West
Subject: RE: RE: AI Request for crude tanks project

Our Crude buyer calls it AWB crude. It is from Canada. All three of the manifest cars were from the same supplier.

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Tuesday, September 03, 2013 2:02 PM
To: Matthews, John W
Subject: [EXTERNAL]RE: RE: AI Request for crude tanks project

Sorry, I meant geographic origin or other identifier, (similar to California or San Joaquin Valley or Canada), just to identify that column as different and not an average of the others). (Danny was asking for an additional identifier)

From: Matthews, John W [mailto:John.Matthews@p66.com]
Sent: Tuesday, September 03, 2013 1:59 PM
To: Janice West
Subject: RE: RE: AI Request for crude tanks project

The table was for the proposed crude tank. The crude speciation for the manifest cars was based on three discrete vapor samples taken directly from the representative manifest cars currently being received. The results of the individual samples are in the second, third and fourth columns. The labels on the top of those columns are the DOT numbers of the sampled railcars. The vapor samples were analyzed by EPA Method TO-15.

The maximum from these crude vapor samples (the fifth column) were used in the hybrid speciation.

John W. Matthews, P.E.
Environmental Engineer
Phillips 66 Los Angeles Refinery
(310) 952-6213
john.matthews@p66.com

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Tuesday, September 03, 2013 11:25 AM
To: Matthews, John W
Subject: [EXTERNAL]FW: RE: AI Request for crude tanks project

Hi John,

In the attached table, there are columns for SJV crude, "crude oils", Cal crude, and crude hybrid. What is the origin of "crude oils"?

Janice

From: Marcia Baverman [mailto:mbaverman@envaudit.com]
Sent: Tuesday, February 05, 2013 1:58 PM
To: Matthews, John W (P66)

Cc: mchoi@envaudit.com
Subject: [EXTERNAL]RE: AI Request for crude tanks project

John –

Attached is the derivation of the "hybrid" speciation used to calculate the emissions in the EPA Tanks 4.0 model. The hybrid speciation is the highest concentration for each TAC from each of the three crude speciations used in the most recent AB2588 HRA. The hybrid speciation allows for only having to run one scenario to determine the TAC emissions for use in the HRA.

Thanks -

Marcia Baverman
Project Manager
714-632-8521 ext. 237
mbaverman@envaudit.com

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From: Matthews, John W (P66) [mailto:John.Matthews@p66.com]
Sent: Tuesday, January 15, 2013 10:24 AM
To: 'MBaverman@EnvAudit.com'
Subject: FW: AI Request for crude tanks project

As discussed.

From: Janice West [mailto:jwest@aqmd.gov]
Sent: Thursday, January 10, 2013 1:49 PM
To: Matthews, John W (P66)
Subject: [EXTERNAL]AI Request for crude tanks project

Hi John,

As I mentioned on the phone, I am requesting additional information in support of your crude tanks applications Please provide the following information:

- Details on the speciation of crude oil (the toxics speciation you used in your TANKS calculations), as well as the origin of this speciation and why you feel it is the worst-case scenario for toxics.
- The true vapor pressure limit you are willing to accept for the operation of these tanks (emissions will be recalculated)
- Fugitive counts for the existing crude tanks (and whether this project will cause any changes—if so, provide pre and post-project counts)
- Information on the impact of the project on the benzene stripper (particularly fugitive counts), and your justification for why an additional application is not needed for that permit unit.

Paul, Tran and I met with Jay yesterday, and after our discussion, Jay instructed me to consider the existing tanks as post-NSR tanks, based on the information in the files, as well as the presence of a throughput limit. I will be re-calculating the baseline emissions using the Tanks program (and the parameters specified in the original permit to operate application), so that the calculation method is the same for pre- and post-project emissions.

Please let me know if you have any comments or questions. I'll wait to proceed until I hear from you.

Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Janice West

From: Matthews, John W [John.Matthews@p66.com]
Sent: Tuesday, September 03, 2013 1:59 PM
To: Janice West
Subject: RE: RE: AI Request for crude tanks project
Attachments: Speciation Data.pdf

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Marcia Baverman
Project Manager
714-632-8521 ext. 237
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Thanks,

Janice West
Air Quality Engineer
South Coast Air Quality Management District
909 396-3763
jwest@aqmd.gov

Comments

on the

Draft Environmental Impact Report (DEIR)

for the

Valero Benicia Crude by Rail Project

Benicia, California

September 15, 2014

Phyllis Fox, Ph.D., QEP, PE, DEE
745 White Pine Ave.
Rockledge, FL 32955
phyllisfox@gmail.com
321-626-6885

I have reviewed the Draft Environmental Impact Report (DEIR)[1] for the Valero Benicia Crude by Rail Project (CBR Project) prepared for the City of Benicia (City) by ESA, as well as records referenced in the DEIR and files obtained from the Bay Area Air Quality Management District (BAAQMD).

The CBR Project will install facilities to allow the Valero Benicia Refinery (Refinery) to receive up to 70,000 barrels per day (bbl/day) of North American crude oils by rail. The facilities that would be installed include about 8,880 feet of new track; a new tank car unloading rack capable of unloading two parallel rows of tank cars simultaneously; and 4,000 feet of 16-inch diameter crude oil pipeline and associated fugitive components (valves, flanges, pumps) connecting the offloading rack and an existing crude supply pipeline. DEIR, pp. ES-1 to ES-4.

Based on my review, I conclude this DEIR is fundamentally defective in that it omits crucial information to understanding the Project's significant impacts. Specifically, the DEIR does not disclose the Project's crude slate, relies on flawed analyses in addressing whether the Project would enable refining of substantial quantities of tar sands and Bakken crudes, relies on unsupported assumptions as to the Project's light crude composition, and underestimates the Project's operational emissions of reactive organic gases ("ROG") and toxic air contaminants ("TAC"). When these underestimates are corrected, the CBR Project results in significant air quality and public health impacts. The City must correct these defects and recirculate the DEIR, so that the public and decision-makers can be fully informed of the Project's air quality and public health and safety impacts.

My resume is included in Exhibit A to these Comments. I have over 40 years of experience in the field of environmental engineering, including air emissions and air pollution control; greenhouse gas (GHG) emission inventory and control; air quality management; water quality and water supply investigations; hazardous waste investigations; hazard investigations; risk of upset modeling; environmental permitting; nuisance investigations (odor, noise); environmental impact reports, including CEQA/NEPA documentation; risk assessments; and litigation support.

I have M.S. and Ph.D. degrees in environmental engineering from the University of California at Berkeley with minors in Hydrology and Mathematics. I am a licensed professional engineer (chemical, environmental) in five states, including California; a Board Certified Environmental Engineer, certified in Air Pollution Control by the American Academy of Environmental Engineers; and a Qualified Environmental Professional, certified by the Institute of Professional Environmental Practice.

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[1] ESA, Valero Benicia Crude by Rail Project, Draft Environmental Impact Report, SCH # 2013052074, Use Permit Application 12PLN-00063, June 2014.

I have prepared comments, responses to comments and sections of EIRs for both proponents and opponents of projects on air quality, water supply, water quality, hazardous waste, public health, risk assessment, worker health and safety, odor, risk of upset, noise, land use and other areas for well over 100 CEQA documents. This work includes Environmental Impact Reports (EIRs), Negative Declarations (NDs), and Mitigated Negative Declarations (MNDs) for all California refineries; crude oil and rail terminals in California, Louisiana, Oregon, New York, Texas, and Washington; and various other permitting actions for tar sands and light shale crude refinery upgrades in Indiana, Louisiana, Michigan, Ohio, South Dakota, Utah, and Texas and liquefied natural gas (LNG) facilities in Texas, Louisiana, and New York.

My work has been cited in two published CEQA opinions: (1) *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (2001) 111 Cal.Rptr.2d 598 and *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310.

I commented on the Initial Study/Mitigated Negative Declaration (IS/MND) (attached to the DEIR as Appx. A[2]) that the CBR Project would allow a change in crude oil slate quality, to heavier higher sulfur crudes and/or to lighter sweeter crudes, which would result in emission increases that were not considered in the CEQA review. Fox IS/MND Comments[3], pp. 2-35. The DEIR does not correct the defects that I identified in my IS/MND comments. Rather, it advances an argument that the rail-imported crudes will be blended with other crudes to meet the same sulfur and weight specifications as in the baseline Refinery. Thus, the DEIR asserts that crude slate quality and emissions from refining it would not change. This is incorrect. This does not address my comments on the IS/MND. Therefore, I reassert my IS/MND comments and incorporate them here by reference. The following sections present my evaluation of the DEIR's response to my previous crude slate switch comments, point by point. The DEIR's response to my comments is included in Appendices C.1 and C.2, based on a report contained in Appendix K. The following comments on Appendices C.1 and C.2 apply equally to the underlying analyses in Appendix K.

[2] ESA, Valero Crude by Rail Project, Initial Study/Mitigated Negative Declaration, Use Permit Application 12PLN-00063, Prepared for City of Benicia, May 2013.

[3] Phyllis Fox, Comments on Initial Study/Mitigated Negative Declaration for the Valero Crude by Rail Project, Benicia, California, Use Permit Application 12PLN-00063, July 1, 2013; http://www.ci.benicia.ca.us/vertical/sites/%7B3436CBED-6A58-4FEF-BFDF-5F933121593 2%7D/uploads/Report_by_Dr._Phyllis_Fox.pdf.

I. THE DEIR FAILS TO ANALYZE THE AIR QUALITY IMPACTS FROM REFINING DIFFERENT TYPES OF CRUDE

A. Heavy Sour Crudes

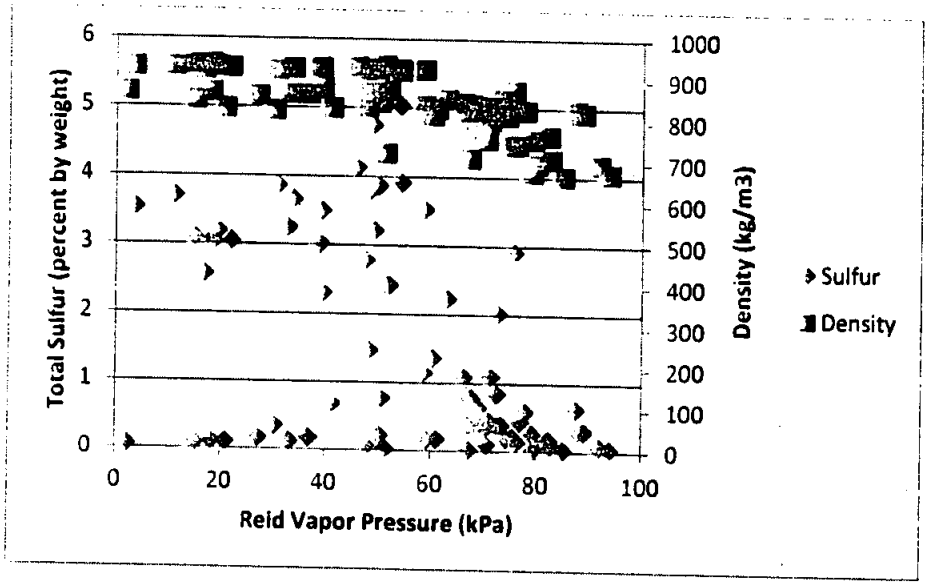
The CBR Project DEIR responds to the heavy sour crude slate issues that I raised in Appendix C.1. The thrust of the CBR Project DEIR's response is based on the "weight" (API gravity)[1] and sulfur content of the crude, which it argues would not change due to the Project, but rather would remain within a narrow range. Therefore, the CBR Project DEIR argues, emissions would not increase. The CBR Project DEIR argues: "Thus, to the extent that the Project would cause an increase in emissions based on an increase in the weight and sulfur content of crude feedstocks – any such emissions increase would be within the baseline environmental conditions." DEIR, Appx. C.1, p. C.1-3.

First, this misses the point, as explained in my previous comments at Section II.D, pp. 19-31. There are important differences between crudes that are not related to the weight and sulfur content of the crude that result in adverse impacts. Even if the weight and sulfur content of a particular crude blend fall within the range specified in the DEIR, or don't change at all, other components in the crude, such as TACs like benzene, or highly malodorous compounds such as mercaptans, may be present at much higher concentrations than in the crudes they replace with identical sulfur and API gravity.

Further, other characteristics of the crude, such as its vapor pressure or flammability, may differ in significant ways from the crudes they would replace. These other constituents and properties are not a function of the API gravity or the sulfur content and are present independent of them. The DEIR's consultant, Dr. McGovern, demonstrated there is no relationship between vapor pressure (expressed as RVP) and crude gravity (expressed as API). DEIR, Appx. K, p. K-18. This is further substantiated by analysis of data published by Enbridge, summarized here in Figure 1. The Enbridge data covering 76 different types of crude oil show that crude oil attributes of sulfur content and density are completely independent of vapor pressure.

[1] Note that throughout the DEIR, the term "weight" is used to indicate API gravity or density, where "density" is technically what is meant. We will use the same terminology in this report; "weight" indicates density.

Figure 1: Reid Vapor Pressure Compared to Total Sulfur and Density for 76 different types of Crude Oil



Source: Enbridge Pipelines Inc., 2013 Crude Characteristics, http://www.enbridge.com/~/media/www/Site%20Documents/Delivering%20Energy/2013%20Crude%20Characteristics.pdf

The vapor pressure of crude determines to a large extent the amount of ROG and TAC emissions that are emitted when it is transported, stored, and refined. Thus, a crude slate may have identical sulfur content and weight, but would result in dramatically different ROG and TAC emissions. Similarly, the nature of the chemical bonds in crude determines the amount of energy and hydrogen that must be supplied to refine it. Thus, a crude slate may have identical sulfur and weight, but a different mix of chemicals that would affect the amount of energy and hydrogen required to convert it into refined products.

These differences—in both chemical and physical characteristics other than API gravity and sulfur content— fluctuate independent of sulfur content and API gravity and will result in significant impacts that have not been considered in the DEIR. These impacts include, for example, significant increases in ROG emissions, contributing to existing violations of ozone ambient air quality standards; significant increases in TAC emissions, resulting in significant health impacts; significant increases in malodorous sulfur compounds, resulting in significant odor impacts; significant increases in combustion emissions, contributing to existing violations of ambient air quality standards; and significant increases in flammability and thus the potential for more dangerous accidents involving train derailments or spills on-site. The DEIR fails to consider these significant impacts by raising irrelevant issues.

Second, the rationale that sulfur levels and density of the crude slate would stay within a narrow range ignores the possibility of gradual creep within that range that would still be

significant. This recently occurred at the nearby Chevron Richmond Refinery. This refinery gradually changed crude slates, while staying within its established crude unit design basis for total weight percent sulfur of the blended feed to the crude unit.[5] This change increased corrosion rates in the 4-sidecut line, which led to a catastrophic pipe failure in the #4 Crude Unit on August 6, 2012. This accident sent 15,000 people from the surrounding area for medical treatment due to the release and resulting fire that created huge black clouds of pollution over the surrounding community. Fox IS/MND Comments, pp. 25–26.

These types of accidents can be reasonably expected to result from incorporating tar sands crudes into the Benicia crude slate, even if the range of sulfur and gravity of the crudes remain the same, unless significant upgrades in metallurgy occur, as these crudes have a significant concentration of sulfur in the heavy components of the crude coupled with high total acid number (TAN) and high solids, which aggravate corrosion. The gas oil and vacuum resid piping, for example, may not be able to withstand naphthenic acid or sulfidation corrosion from tar sands crudes, leading to catastrophic releases.[6] Fox IS/MND Comments, pp. 35-36.

Catastrophic releases of air pollution from these types of accidents were not considered in the DEIR. Rather, the DEIR relies on the Refinery's existing Process Safety Management program, including the Management of Change (MOC) and Mechanical Integrity (MI) programs, to prevent corrosion. DEIR, p. 3-16. However, these programs were also in place at Chevron at the time of the August 2012 accident discussed above, and they did not prevent a catastrophic accident caused by sulfur creep. The recent Chevron FEIR incorporated many additional mitigation measures to improve these programs,[7] which should be required for the Valero Rail Project.

Third, the unloading rack, storage tanks and associated fugitive components are major sources of the ROG and TAC emissions. These unload, transport, and store crude oil as delivered, before it is blended. Therefore, the argument that the rail-imported crude is blended before it is refined is irrelevant.

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[5] US Chemical Safety and Hazard Investigation Board, Chevron Richmond Refinery Pipe Rupture and Fire, August 6, 2012, p.34 ("While Chevron stayed under its established crude unit design basis for total wt. % sulfur of the blended feed to the crude unit, the sulfur composition significantly increased over time. This increase in sulfur composition likely increased corrosion rates in the 4-sidecut line.").

[6] See, for example, K. Turini, J. Turner, A. Chu, and S. Vaidyanathan, Processing Heavy Crudes in Existing Refineries. In: Proceedings of the AIChe Spring Meeting, Chicago, IL, American Institute of Chemical Engineers, New York, NY, Available at: http://www.aiche-fpd.org/listing/112.pdf.

[7] See, for example, Chevron Refinery Modernization Project, Revisions to Draft EIR Volumes 1& 2, p. 4-40, Mitigation Measure 4.13-7h, Available at: http://chevronmodernization.com/project-documents/.

1. The CBR Project DEIR Must Evaluate the Potential Impacts of the Full Range of Crude Oil Types That Could Be Imported

The CBR Project DEIR asserts: "There is no reason to believe that...Valero would be more likely to purchase heavy Canadian crudes than any number of other North American crudes that are lighter and/or sweeter..." DEIR, Appx. C.1, p. C.1-1. The CBR Project DEIR presents a table that lists 38 "available North American crudes" that could potentially be imported by the proposed rail facilities. DEIR, Table 3-1. Of these 38 crudes, 87% or 33 of them, are Canadian tar sands crudes and of the tar sands, 15 are "heavy sour" and 5 are "medium sour." Canadian tar sands crudes are chemically distinct from the current crude slate and thus will result in significant impacts that were not analyzed in the CBR Project DEIR. Fox IS/MND Comments, pp. 25-28. DEIR Table 3-1 is prima facie evidence that tar sands crudes are likely to be in the mix of crudes that will be imported by the CBR Project.

Regardless of which of these 38 crudes is selected, the DEIR must analyze the full range of resulting impacts, from all of the 38, as the DEIR suggests all or any of them may be refined. Impacts would vary greatly between tar sands crudes on the heavy high sulfur end and by Bakken crudes on the light sweet end, each end of this range with unique and significant impacts. The DEIR does not include impacts from either of these, but rather only an unidentified default crude that is not representative of any of the 38. See Comment III.

2. Blended Weight and Sulfur Content Do Not Determine ROG and TAC Emissions

The CBR Project DEIR argues that "even if Valero were to purchase large amounts of heavy sour Canadian crudes as a result of the Project, this would not cause an increase in refinery emissions because Valero must blend crude feedstocks to a narrow range of weight and sulfur content before processing them." DEIR, pp. 3-14, 3-24, 4.1-17, C.1-1/2. This is insufficient information to analyze impacts, as noted above, because the weight (API gravity) and sulfur content are not the only characteristics of crude oil that determine environmental impacts. Other important factors include volatility, flammability, metal content, ROG speciation profile, the specific suit of heavy organic compounds in the crude, and the TAC and sulfur speciation profile (i.e., the concentration of individual TAC and sulfur compounds present in the crude).

Elevated levels of benzene or hydrogen sulfide, for example, cannot be blended out because they are emitted from tanks and fugitive components before the crudes reach the mixing tanks. The majority of the toxic TACs and malodorous chemicals are emitted before blending occurs, during unloading and from fugitive components along the pipeline and at the storage tanks. Blending by itself does not eliminate them.

Similarly, elevated metals that end up in coke fugitive particulate emissions cannot be blended out. No matter how much blending is done with relatively less contaminated crudes, a significant amount of heavy metals from lower quality rail-imported crude would still remain, mostly partitioning to the coke. Blending also does not remove but only dilutes elevated concentrations of high molecular weight organic compounds such asphaltenes and resins that require high energy input to break down into marketable products. Fox IS/MND Comments, pp. 4-10. These characteristics may vary in significant ways among crudes with the same range of API gravity and sulfur, resulting in significant environmental impacts. Fox IS/MND Comments, pp. 29-30.

3. Crude Slate Impacts Are Not Part of the Baseline

The CBR Project DEIR indicates that Valero made significant modifications to the Refinery between 2004 and 2010. These modifications are collectively known as the "Valero Improvement Project" or VIP. The City certified the VIP project EIR and approved the VIP project in April 2003. It later certified the VIP EIR addendum in July 2008. DEIR, p. 3-12.

The CBR Project DEIR argues that crude slate impacts are part of the VIP baseline, "[e]ven if refinery emissions were to increase based on Valero's purchase of heavy sour Canadian crudes, any such emissions increases would properly be considered part of the baseline because the baseline includes the full scope of operation allowed under existing permits that were issued based upon prior CEQA review." DEIR, p. C.1-1. The DEIR cites several CEQA cases regarding subsequent environmental review for modifications to existing projects.

Setting aside legal considerations, this argument has no technical merits for three reasons. First, the scope of operations previously approved did not include any impacts from a crude slate change and did not contemplate the crudes listed in DEIR Table 3-1. Second, the CBR Project Project is not a modification of the previously permitted VIP, which underwent CEQA review. Third, even assuming the VIP EIR evaluated a crude slate change and the CBR Project is just a modification of the VIP, both of which are false, the regulatory framework has changed, requiring additional CEQA review.

a. The Scope of the VIP Project Did Not Include Impacts from Crude Slate Change

Even if the CBR Project were simply a modification of the VIP Project, the VIP EIR did not evaluate impacts from a crude slate change. The existence of permits, absent CEQA review of the proposed change, is not determinative.

The VIP CEQA documents do not discuss cost-advantaged North American crudes, such as those in CBR Project DEIR Table 3-1. None of these crudes is evaluated, or even identified,

in the VIP EIR. Thus, the impacts of refining these crudes were in no way considered or incorporated. Therefore, the CBR Project DEIR cannot rely on the VIP CEQA review to address the impacts of refining any of them. Rather, the VIP EIR proposed to import heavy sour crudes by ship. The crudes available by ship in 2002 are chemically and physically different from the crudes available by rail in 2014, over a decade later. The oil markets have changed dramatically due to the advent of fracking and the development of tar sands, all of which occurred long after the VIP EIR analyses were performed.

There are many cost-advantaged, heavy high sulfur crudes that likely were the target of the VIP analyses prepared in 2002, such as heavy sour crudes from Ecuador, Venezuela, Colombia and Iraq, which were refined at the post-VIP Refinery. Fox IS/MND Comments, Figure 1. These heavy sour crudes are distinguishable from the crudes that are currently the target of the CBR Project, which are tar sands crudes and light sweet crudes with distinct physical and chemical characteristics. DEIR, p. C.2-1. The crudes that are currently the target of the CBR Project (DEIR, Table 3-1) were not available in the marketplace in 2002 when the VIP CEQA analysis was performed and thus were not considered in prior CEQA analyses. The differences between the crudes considered in the VIP EIR and those that would be imported by the CBR Project are discussed in my July 2013 comments on the IS/MND.

There is no evidence that the VIP was designed to refine, and that the VIP CEQA review addressed, the unique impacts of refining any of the cost-advantaged North American crudes listed in DEIR Table 3-1. Further, the lynchpin of the VIP EIR, a new, bigger hydrogen plant to allow refining of more heavy sour crude, may not be built as Valero has enough hydrogen to meet its current needs. DEIR, p. 3-12. This could be due to the availability of hydrogen from another source or a change in crude slate to lighter crudes that do not require more hydrogen to refine.

Bakken and Bakken blends with tar sands crudes, for example, would fall into this class. Further, the rail emissions assume a line haul one-way distance of 1,500 miles (DEIR, p. 4.1-22 and Appx. E.5, pdf 1197), which is consistent with Bakken crudes. There is no evidence in the record that impacts from refining this lighter, sweeter crude were considered in the VIP EIR. These impacts are discussed below in Comment I.B.

b. The CBR Project Is a New Project

The City did not treat the CBR Project as a modification of a previously permitted project in the IS/MND, but rather as a new project. Furthermore, even the DEIR refers to the VIP as a "previous" project. DEIR at 1-4. The characterization of the CBR Project as a modification of the VIP Project in the DEIR for baseline purposes improperly characterizes the projects and causes the CBR Project DEIR to underestimate or ignore real environmental impacts.

c. The Regulatory Framework Has Changed, Requiring Additional CEQA Review

Even if one hypothetically assumed that the VIP EIR evaluated the crude slate switch facilitated by the CBR Project, the regulatory and informational framework within which the CBR Project would be developed has changed dramatically, rendering the 2002 analysis obsolete. The City certified the VIP project EIR and approved the VIP project in April 2003. It later certified a VIP EIR addendum in July 2008. DEIR, p. 3-12. The Addendum incorporated a flue gas change related to the Main Stack Scrubber and added an analysis of greenhouse gas emissions. These changes do not affect any of the issues discussed here.[8]

When the VIP CEQA analysis was performed, none of the cost-advantaged crudes listed in Table 3-1 were in the marketplace. In response to ESA questions, for example, Valero responded that the CBR Project "was implemented to take advantage of land-locked North American crudes that have **recently** become available." Valero 2013,[9] p. 1 (emphasis added). As discussed earlier, these crudes are notably different from the current crude slate, in ways that are much broader than just sulfur content and weight. Thus, none of the impacts of refining these physically and chemically distinct crudes could have been anticipated and evaluated in 2002 when the VIP CEQA analysis was performed. Further, as explained in my comments on the IS/MND, the regulatory framework has significantly changed, requiring additional CEQA review even if the Project were a modification of a project that had previously undergone CEQA review. Fox IS/MND Comments, pp. 33-34.

Since the VIP FEIR was certified in 2003, new scientific evidence about the potential adverse impacts of air pollutants has become available, and in response, new guidance has been published and several federal and state ambient air quality standards have been revised. These include:

- The 8-hour state ozone standard was approved by the California Air Resources Board (CARB) on April 28, 2005 and became effective on May 17, 2006;
- The U.S. Environmental Protection Agency (EPA) lowered the 24-hour PM2.5 (particulate matter equal to or smaller than 2.5 micrometers) standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006. EPA designated the Bay Area as nonattainment of this PM2.5 standard on October 8, 2009;
- On June 2, 2010, the EPA established a new 1-hour SO_2 (sulfur dioxide) standard, effective August 23, 2010;

[8] Valero Improvement Project, Addendum to VIP EIR, June 2008, Available at: http://www.ci.benicia.ca.us/vertical/sites/%7B3436CBED-6A58-4FEF-BFDE-5F93312159 32%7D/uploads/%7B5A35F17D-5E23-404C-8032-6597BE84B5F9%7D.PDF.

[9] Valero Responses to: Valero Crude by Rail Project Data Request Number 2, April 2, 2013.

- The EPA promulgated a new 1-hour NO_2 (nitrogen dioxide) standard of 0.1 ppm, effective January 22, 2010;
- The EPA issued the greenhouse gas tailoring rule in May 2010, which requires controls of GHG emissions not contemplated in the VIP FEIR or the 2008 Addendum;
- The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure below which there are no adverse health effects determined;
- The EPA issued a final rule for a national lead standard, rolling 3-month average, on October 15, 2008. The Project would increase lead emissions. Fox IS/MND Comments, p. 1, 20;
- Various BAAQMD regulations, including Regulation 2-2 (adopted December 19, 2012); and
- BAAQMD is currently developing a regional refinery regulation that could require additional emission controls.

B. Light Sweet Crudes

Light sweet crudes such as Bakken could be imported by rail and could result in an increase in ROG and TAC emissions from storage tanks, pumps, compressors, valves, and connectors that were not considered in the IS/MND. Fox IS/MND Comments, pp. 11, 25-28. The CBR Project DEIR concedes that "[o]nce the Project is constructed and operational, Valero may well purchase large amounts of light sweet North American crudes. In fact, this is Valero's stated plan." DEIR, p. C.2-1. Elsewhere, the DEIR notes that "[o]nce the Project is complete, Valero plans to obtain North American crudes that are, on average, lighter and sweeter than Valero's current feedstocks. According to Valero, the North American crudes will be 'Alaskan North Slope (ANS) look-alikes or sweeter' (Valero, 2013)." DEIR, p. 3-24. The closest and most cost advantaged of light sweet North American crudes listed in Table 3-1 that could be blended to be an ANS look-alike is Bakken crude.

An ANS look-alike crude, for example, could be created by blending 55% Bakken and 45% Western Canadian Select at a cost potentially far less than the ANS market price. The resulting mix has the same API gravity and slightly higher sulfur than ANS, and virtually identical distillation yields.[10] Both of these crudes are listed as available North American crudes in the DEIR. DEIR, Table 3-1. See also DEIR, pp. K-16/17. Alternatively, some of the lighter crudes, such as Bakken, could be fed directly to refining units, such as the fluid catalytic cracking unit (FCCU), eliminating the need for blending. Thus, the DEIR must evaluate the

[10] John R. Auers and John Mayes, North American Production Boom Pushes Crude Blending, Oil & Gas Journal, May 6, 2013. Available at: http://www.ogj.com/articles/print/volume-111/issue-5/processing/north-american-production-boom-pushes.html.

impacts of importing by rail and processing both Bakken and tar sands crudes, which span the range of likely impacts.

1. Bakken Crudes Have Properties That Will Result in Significant Impacts Not Evaluated in the DEIR

The DEIR makes the same arguments as to weight and sulfur content as previously made with respect to heavy sour crudes. The DEIR asserts that refining 70,000 bbl/day of light sweet crude would not cause an increase in ROG emissions because: "(a) Valero must blend crude feedstocks to a narrow range of weight and sulfur content before processing them, and (b) therefore, the average weight and sulfur content of crudes delivered to the Refinery will remain the same. In other words, any deliveries of light North American crudes by rail would simply replace the delivery of other light crudes by ship." DEIR, p. C.2-1. This is wrong for two principal reasons.

First, this is wrong because most of the ROG and TACs are emitted before the crudes are blended, from the rail cars, unloading, pipeline fugitive components (valves, pumps, connectors), and crude storage tanks. According to the Project description, two unit trains, each potentially carrying Bakken crude oil, would be unloading within a 24-hour period. DEIR, p. 3-22. This would result in an increase in daily ROG and TAC emissions, regardless of blending downstream to meet ANS-lookalike quality.

Second, this is wrong because all light sweet crudes are not created equal. The average weight (API gravity) and amount of sulfur in light sweet crudes do not determine the amount of ROG and TACs that will be emitted from Refinery tanks, pumps, compressors, valves, and connectors. The DEIR is correct when it asserts that "there is no relationship between the weight of a particular crude oil and the amount of fugitive emissions released from equipment containing that crude oil." DEIR, p. C.2-1. See also Figure 1.

The amount of ROG and TAC emissions is determined by the "volatility" of the crude and the concentration of TACs within the crude, not by its weight or sulfur content. The volatility can vary widely for "light sweet crudes," independent of weight and sulfur content. Processing in the oil fields, in particular, significantly affects volatility of shipped crudes, as discussed below. Bakken crudes, which are likely to be imported by the CBR Project, have uniquely elevated volatility, which has led to many spectacular accidents, such as those that occurred at Lac-Mégantic[11]; Casselton, North Dakota[12]; Alabama[13]; and more recently, Lynchburg, Virginia.[14]

[11] NTSB, Safety Recommendation In reply refer to: R-14-4 through -6; January 21, 2014. Available at: http://www.ntsb.gov/doclib/recletters/2014/R-14-004-006.pdf.

Volatility is measured in pounds per square inch (psi) and is typically reported as Reid Vapor Pressure (RVP).[15] Vapor pressure is an indirect measure of the evaporation rate of volatile compounds in the crude oil, with higher vapor pressures indicating greater losses from evaporation. The DEIR neglected to disclose the well-known relationship between the vapor pressure of a crude and the amount of emissions released from equipment containing the crude,[16] which is incorporated into the EPA TANK 4.0.9d model, universally used to estimate ROG and TAC emissions from tanks, including in the DEIR for this Project.

The CBR Project would facilitate the import of Bakken crudes, which have uniquely elevated vapor pressures compared to the light sweet crudes they would replace. As discussed elsewhere in these comments, most of the imported crude that would be replaced is Alaska North Slope (ANS) crude (API gravity = 31.6°, S = 0.96%) and similar or heavier foreign imports. The ANS crude has a Reid Vapor Pressure (RVP) of 6.3 psi.[17] Most foreign imports have an even lower RVP. In comparison, Bakken crudes (API gravity = 38-40°, S = 0.2%), the most likely replacement, have a RVP of up to 15.5 psi.[18] Thus, replacing ANS and foreign imports with Bakken would increase ROG and TAC emissions from tanks and fugitive sources by up to a factor of 2.5. The TAC emissions would increase even more as the concentration of TACs in the Table 3-1 crudes are much higher than in the current crude slate.

The volatility and TAC speciation information required to evaluate this crude switch, from ANS, to an ANS-look alike based on a Bakken blend, is completely absent from the DEIR. Vapor pressure and crude TAC speciation information are not confidential and are routinely

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[12] NTSB, Preliminary Report; DCA14MR004, 2014. Available at: https://www.ntsb.gov/doclib/reports/2014/Casselton_ND_Preliminary.pdf.

[13] Karlamangla, Soumya, "Train in Alabama oil spill was carrying 2.7 million gallons of crude." Los Angeles Times, http://articles.latimes.com/2013/nov/09/nation/la-na-nn-train-crash-alabama-oil-20131109, November 9, 2013.

[14] Los Angeles Times, May 1 2014, http://www.latimes.com/nation/nationnow/la-na-nn-ntsb-investigation-fiery-crude-oil-train-derailment-virginia-20140501-story.html.

[15] Measured by American Society for Testing and Materials Method ASTM D323-08, Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method) is used to determine the vapor pressure at 100 F with initial boiling point above 32 F.

[16] See AP-42, Section 7.1: Organic Liquid Storage Tanks.

[17] ExxonMobil Refining and Supply Company, ANS11U. Available at: http://www.exxonmobil.com/crudeoil/about_crudes_ans.aspx and http://www.exxonmobil.com/crudeoil/download/ans11u.pdf.

[18] Classification and Hazard Communication Provisions for Crude Oil – Bakken Crude Oil Data, June 13, 2014. Available at: http://www.unece.org/fileadmin/DAM/trans/doc/2014/dgac10c3/UN-SCETDG-45-INF26e.pdf; Dangerous Goods Transport Consulting, Inc., A Survey of Bakken Crude Oil Characteristics Assembled for the U.S. Department of Transportation, Submitted by American Fuel & Petrochemical Manufacturers, May 14, 2014, pp. 5, 19, Available for download from: https://www.afpm.org;

North Dakota Petroleum Council, Bakken Crude Quality Assurance Study, Available at: http://www.ndoil.org/image/cache/Summary_2.pdf;

included in public documents to support tank and fugitive emission calculations. Further, crude assay data is widely reported.[19] See, for example, the Tesoro Vancouver Application.[20]

The DEIR offers irrelevant information to support its theory, arguing that "the amount of fugitive emissions from a piece of equipment is a function of the mechanical integrity of the equipment and the pressure applied to its contents. The weight of the crude oil is not a factor." DEIR, p. C.2-2. While this is partially correct, in that the design of the equipment and the pressure exerted by the contained crude oil on this design are important factors that determine the amount of emissions during routine operations, it fails to acknowledge other key factors such as RVP and TAC concentrations in the crude discussed above. The DEIR must evaluate the foreseeable scenarios of both light sweet crude, including Bakken, and heavy sour crude, including tar sands.

The foreseeable switch from ANS and other current components of Valero's crude slate to a Bakken crude or a Bakken-tar sands mix, included in DEIR Table 3-1, is a feedstock change that should have been explicitly identified and evaluated in the DEIR. These new crudes are chemically and physically different from the current crude slate and the crude slate evaluated in the VIP EIR in ways that are not captured by exclusive consideration of crude slate sulfur content and API gravity. These differences will result in significant impacts not evaluated or disclosed in the CBR Project DEIR.

Bakken crudes have unique chemical and physical characteristics that distinguish them from currently refined crudes and which would result in significant environmental impacts not identified in the DEIR, including significant risk of upset, air quality, odor, and public health impacts. These unique characteristics include high volatility, flammability,[21] and elevated concentrations of TACs and ROG.

The amount of TACs and ROG released from storage tanks and fugitive components depends upon the vapor pressure of the crude oil. Bakken crude oils are the most volatile of the

[19] Jeff Thompson, Public Crude Assay Websites, February 24, 2011. http://www.coqa-inc.org/docs/default-source/meeting-presentations/20110224_Thompson_Jeff.pdf.

[20] Tesoro Savage, Application for Site Certification Agreement (Vancouver Application), vol. 1, August 29, 2013. Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%201/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%201.pdf and vol. 2, Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%2011%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%2011.pdf.

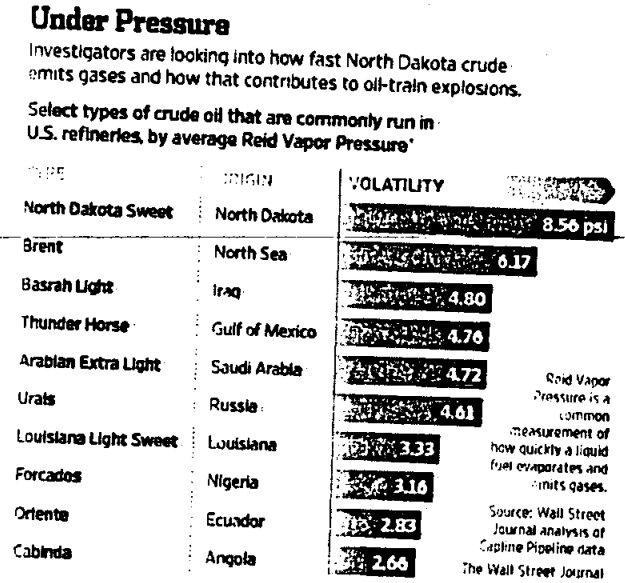
[21] Flammable crude oils will ignite when they are mixed with air in certain concentration ranges. The lowest temperature at which they produce sufficient vapor to support combustion is called the "flash point".

crudes listed in DEIR Table 3-1. Crude oil data collected by Capline Pipeline, which tested crudes from 86 locations world-wide for vapor pressure, found the following:[22]

> "[l]ight, sweet oil from the Bakken Shale had a far higher vapor pressure – making it much more likely to throw off combustible gases – than crude from dozens of other locations... According to the data, oil from North Dakota and the Eagle Ford Shale in Texas had vapor-pressure readings of over 8 pounds per square inch, although Bakken readings reached as high as 9.7 PSI. U.S. refiner Tesoro Corp., a major transporter of Bakken crude to the West Coast, said it regularly has received oil from North Dakota with even more volatile pressure readings – up to 12 PSI. By comparison, Louisiana Light Sweet from the Gulf of Mexico, had vapor pressure of 3.33 PSI, according to the Capline data."

This data, summarized in Figure 1, shows that "light" crude oils vary substantially in vapor pressure and thus would have a wide range of environmental impacts when stored and transported. The more volatile the crude, the higher the ROG, TACs, and methane (a potent greenhouse gas) emissions, the higher the flammability, and the greater the potential consequences in the event of an accident. Thus, the DEIR's assertions that there will be no increase in ROG and TACs as lights will replace lights is simply inaccurate.

Figure 2: Volatility (psi) of Some Commonly Refined Crude Oils



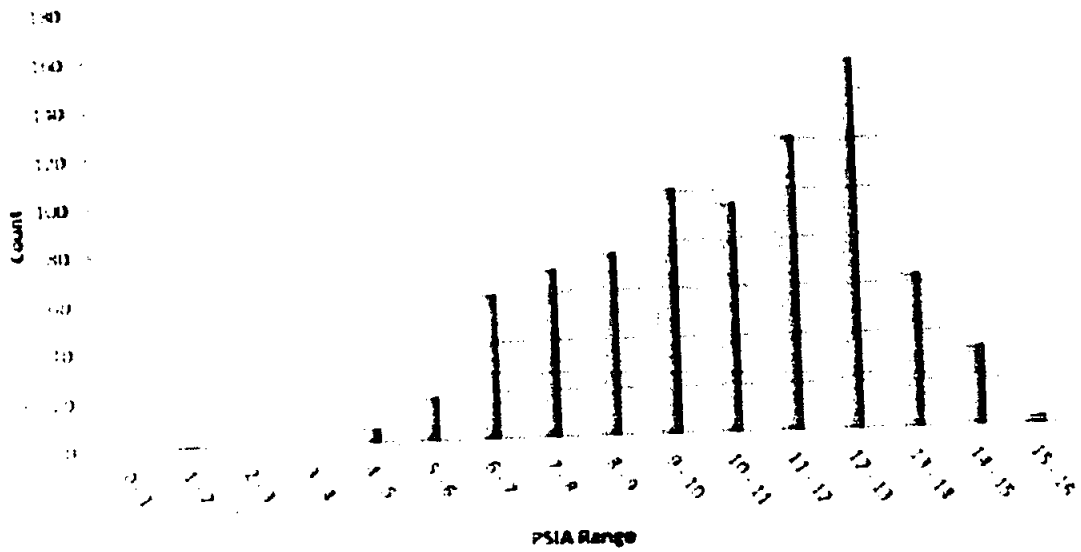
Source: Wall Street Journal, February 23, 2014

[22] Russell Gold, Analysis of Crude From North Dakota Raises Further Questions About Rail Transportation, Wall Street Journal, February 23, 2014.

Other data, summarized by American Fuel & Petrochemical Manufacturers[23] indicate that the RVP of Bakken crude oil can be substantially higher than the value reported based on Capline Pipeline data. A study of Bakken crudes involved in the Lac-Mégantic accident by the Transportation Safety Board of Canada (TSBC)[24] concluded that the volatility and flammability of Bakken crudes were more similar to gasoline than to crude oil, distinguishing Bakken crudes from conventional crude oils.

Figure 3

RVP Frequency for Bakken Crudes



Source: Dangerous Goods Transport Consulting, Inc., 2014

Bakken and other light crude oils taken straight from the well typically contain large amounts of natural gas liquids (NGLs), known as light ends or condensate.[25] These include C2 to C5 hydrocarbons: methane, propane, butane, ethane, and pentane. These are the components most likely to volatilize, burn, or explode in an accident. These light ends have the effect of increasing a crude's vapor pressure, lowering its flash point and lowering its initial boiling point, all of which result in increased environmental risks. These are called "live" crude oils. The high concentration of light ends makes them highly flammable, more likely to form fire balls and

[23] Dangerous Goods Transport Consulting, Inc., 2014, North Dakota Petroleum Council.

[24] Transportation Safety Board of Canada, TSB Laboratory Report LP148/2013 (TSBC 2013), Available at: http://www.bst-tsb.gc.ca/eng/lab/rail/2013/lp1482013/LP1482013.asp.

[25] Dangerous Goods Transport Consulting, Inc., 2014, https://www.afpm.org/WorkArea/DownloadAsset.aspx?id=4229.

boiling liquid expanding vapor explosions (BLEVES) in accidents. The failure to recognize this resulted in a significant underestimate of ROG and TAC emissions and hazards in the CBR Project DEIR.

In most petroleum-producing regions, light ends are removed before they are shipped using a stabilizer—a tall, cylindrical tower that uses heat to separate the light ends, which are then condensed and sent to a fractionator for processing. Crude stabilizers and NGL pipelines to send the recovered NGLs to market are ubiquitous in oil fields that produce light crude oils as crude pipeline specifications set pressure limits that force stripping of the NGLs. However, in the Bakken fields, this infrastructure is rare and most Bakken crude that is shipped by rail is shipped live. This distinguishes it from other light crudes, which are shipped dry, e.g., Eagle Ford crudes in Texas, where oil field infrastructure exists to process it and most of it is shipped by pipeline, which requires that NGLs be stripped.[26]

Other crudes that Bakken would replace, such as ANS, are hard to ignite because they do not have as much combustible light ends. Most light crudes, including the imported foreign crudes currently processed, are stabilized. These stabilized crudes will not actively boil at ambient temperature and can be more safely shipped, stored, and refined. Thus, while "light" crude may replace other types of "light" crude, there are major differences in composition that affect environmental impacts. The CBR Project DEIR does not impose any condition(s) that require that NGLs be removed from received crudes to mitigate these impacts. Thus, analyses must assume that they will be present.

In addition, Bakken crudes, when blended with heavy crudes to meet crude slate requirements, have resulted in many refinery operating issues, which increase emissions. These include fouling of the cold preheat train; desalter upsets; and fouling of hot preheater exchangers and furnaces; as well as corrosion.[27] These operating problems increase emissions. These operating problems and attendant emission increases were not disclosed in the CBR Project DEIR.

2. Crude Slate Impacts Are Not Part of the Baseline

The DEIR next asserts that "[e]ven if VOC emissions were to increase based on Valero's purchase of light North American crudes, any such emissions increases would properly be considered part of the baseline because the baseline includes the full scope of operations allowed under existing permits that were issued based upon prior CEQA review." DEIR, p. C.2-1.

[26] 'Degassing' North Dakota Crude Oil Before Shipping Among Safety Ideas, Insurance Journal, May 14, 2014. Available at: http://www.insurancejournal.com/news/national/2014/05/14/329095.htm.

[27] Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013, http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html.

Elsewhere, the DEIR asserts, "Finally, even if one assumed that Valero will purchase 70,000 barrels per day of light sweet North American crude, and the crudes delivered and processed became substantially lighter, any resulting increase in emissions would be within the baseline for operational air quality impact." This is supported by citing the same suite of CEQA cases relied on for the parallel argument with respect to heavy sour crudes discussed above. DEIR, p. C.2-2. The response to this argument around heavy sour crudes applies equally here and is incorporated by reference.

The baseline argument for light sweet crudes goes a step further than for heavy sour crudes, arguing that "Valero holds permits for all of the Refinery's process equipment... The City and the BAAQMD issued these permits based on the environmental impact report (EIR) for the Valero Improvement Project (VIP) prepared and certified by the City in 2003. The baseline includes the full scope of operations allowed under these permits. In particular, the baseline includes the permitted operation of the Refinery's eight crude oil storage tanks (storage tanks S-57 through S-62, S-1047, and S-1048). In connection with the VIP, the BAAQMD issued permits based on the City's EIR." DEIR, p. C.2-3.

This mischaracterizes the VIP EIR and the permits for the subject tanks. The VIP EIR evaluated only the two new storage tanks (VIP DEIR, p. 3-51) and the increase in ROG emissions from several other unidentified tanks up to a 5 ton/year increase in ROG relative to a 3-year baseline, based on a vapor pressure of 5 psi.[28] VIP DEIR, Table 4.2-9. The CBR Project would facilitate an additional increase in ROG and TAC emissions from these tanks over the same 3-year baseline, due to an increase in the vapor pressure of the stored crude oils and higher amounts of TACs in the rail-imported crudes. Thus, the VIP EIR did not evaluate the full scope of the ROG and TAC emissions that would occur as a result of the CBR Project.

In addition, the VIP EIR analyzed the TAC emissions from these tanks. These emissions were based on a speciation profile that assumes far less toxic air contaminants than would be present in the crudes listed in the CBR Project. DEIR Table 3-1. For example, the VIP EIR calculations assumed that benzene would be present in the crudes stored in new Tanks 1707 and 1708 at 0.009 weight percent (wt.%).[29] The benzene content of the suite of tar sands crudes listed in DEIR Table 3-1 are substantially higher than 0.009 wt.%, ranging from 0.02 wt.% to

[28] The BAAQMD Permit Handbook in Chapter 3.1 refers to U.S. EPA's AP-42 guidelines, Chapter 5.2, in which a default RVP for crude oil is listed as 5 psi, though it is noted that RVP of crude oils can range from less than 1 up to 10 psi. See: http://hank.baaqmd.gov/pmt/handbook/rev02/PH_00_05_03_01.pdf and http://www.epa.gov/ttnchie1/ap42/.

[29] The benzene concentration assumed in the storage tanks is calculated from post-VIP ROG emissions of 193 ton/yr (VIP DEIR, Table 4.2-9) and the post-VIP benzene emissions of 33.93 lb/yr (VIP DEIR, Table 4.7-6) as: 100x[33.93 lb/yr/(193 ton/yr)(2000 lb/ton)] = 0.009 wt%.

0.81 wt.%,[30] or over 2 to 90 times higher. Similarly, Material Safety Data Sheets (MSDSs) submitted by others seeking to import similar cost-advantaged North American crudes, including Bakken, indicate benzene concentrations up to 7 wt.%,[31] with Bakken crudes generally having the highest concentrations of benzene among all those evaluated. Benzene is a known human carcinogen. Human exposure to benzene has been associated with a range of acute and long-term adverse health effects and diseases, including cancer and adverse hematological, reproductive and development effects.[32]

The CBR Project DEIR incorrectly asserts that "even if the Project were to cause an increase in ROG emissions from storage tanks, any such increase would be considered part of the baseline conditions." DEIR, p. C.2-3. The CEQA baseline is not determined by permit conditions, but rather by actual conditions. The full scope of tank operations, i.e., storing crude oils that have much higher vapor pressures and concentrations of TACs than existed in the market place at the time of the 2002 VIP CEQA review, were never subject to CEQA review and must be evaluated in the instant case.

II. THE DEIR UNDERESTIMATED ROG EMISSIONS

The DEIR estimated that the Project would result in a net decrease in ROG emissions of 1.61 ton/yr, as summarized in Table 1. DEIR, Table 4.1-5.

Table 1: Annual and Daily Net Operational ROG Emissions

Source	ROG* (ton/yr)	ROG** (lb/day)
Unloading Rack & Pipeline Fugitive Components	1.88	10.30
Locomotives	1.70	9.32
Marine Vessels (Displaced Baseline)	-5.18	-28.38
Total Net Emissions	**-1.61**	**-8.77**

* Source: DEIR Table 4.1-5

** Calculated as (ton/year)(2000 lbs/ton)/(365 days/year)

[30] www.crudemonitor.ca. Concentrations reported in volume % (v/v) in this source were converted to weight % by dividing by the ratio of compound density in kg/m^3 at 25 C (benzene =876.5 kg/m^3) to crude oil density in kg/m^3, based on the most recent sample, as of June 27, 2014.

[31] TSBC 2013; Tesoro Savage, Application for Site Certification Agreement, vol. 2, Appendix G: Material Safety Data Sheets for Enbridge Bakken (n-hexane = 11%); sour heavy crude oil (benzene = 7%; toluene = 7%; ethylbenzene = 7%; xylene = 7%); sweet heavy crude oil (toluene = 7%); light sweet crude oil (benzene = 7%; toluene = 7%; ethylbenzene = 7%; xylene = 7%). August 29, 2013. Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20II%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%20II.pdf.

[32] CARB. Report to the Scientific Review Panel on Benzene, Prepared by the Staffs of The Air Resources Board and The Department of Health Services, November 27, 1984. Available at: http://www.arb.ca.gov/toxics/id/summary/benzene.pdf; Chronic Toxicity Summary: Benzene. Available at: http://www.oehha.org/air/chronic_rels/pdf/71432.pdf; World Health Organization. Exposure to Benzene: A Major Public Health Concern. Available at: http://www.who.int/ipcs/features/benzene.pdf.

The DEIR underestimated ROG emissions as it excluded many sources of ROG emissions from the Project, discussed below. The *increase* in ROG emissions is significant when these omissions are cured.

A. Decrease In Ship Emissions Are Not Real Or Enforceable

The ROG emissions in Table 1 assume marine vessel emissions would be reduced by 5.18 ton/yr, by eliminating 73 vessel trips (70,000 bbl/day x 365 day/350,000 bbl/vessel). DEIR, p. 4.1-16. The DEIR asserts that "[c]rude oil delivered to the Refinery by tank car would not displace crude oil delivered to the Refinery by pipeline." DEIR, p. ES-3, 1-1.

However, it is well known that San Joaquin Valley crude oil production is declining.[33] The nearby Shell Oil Refinery in Martinez, for example, recently increased crude storage capacity to substitute imported crude oil by marine vessel "for diminishing San Joaquin Valley crude by pipeline." DEIR, Table 5-1. ESA expressed concern that ship deliveries could increase in the future to replace diminishing supplies of crude oil available by pipeline. Valero 2013, Data Request No. 2, Item 1.[34] Further, the BAAQMD Statement of Basis for the VIP Project states: "Valero anticipates the possibility that crude may no longer be brought in by pipeline. This could result from a problem with the pipeline, or a change in the cost of crude that makes pipeline supply no longer economical."[35] Thus, it is entirely possible, especially in the absence of any enforceable conditions of approval, that the Project would not decrease marine deliveries to the extent claimed in the DEIR.

The DEIR must be modified to include clearly stated and enforceable provisions to assure that any increase in ROG and TAC emissions from importing crude by rail rather than by marine vessel or pipeline are fully offset by reductions in ship emissions and that the reductions are achieved in practice. These conditions should include requirements to test, record, and report to the City the RVP of all crude oil delivered by ship, rail, and pipeline and source testing of representative ship and locomotive emissions to assure the reductions are achieved.

B. Storage Tanks ROG and TAC Emissions Were Omitted

The DEIR did not adequately quantify emissions from the tanks that would store the crude oil delivered by rail. The emissions from floating-roof tanks include: tank breathing losses

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[33] California Energy Commission, Margaret Sheridan, California Crude Oil Production and Imports, April 2006. Available at: http://www.energy.ca.gov/2006publications/CEC-600-2006-006/CEC-600-2006-006.PDF.

[34] Valero Responses to: Valero Crude by Rail Project Data Request Number 2, April 2, 2013.

[35] http://www.baaqmd.gov/~/media/Files/Engineering/Title%20V%20Permits/B2626/B2626_2010-05_renewal_03.ashx?la=en.

(the sum of rim seal losses, withdrawal losses, deck fitting losses, and deck seam losses estimated by the EPA model TANKS 4.0.9d) and roof landing losses.

1. Significant Tank Breathing Losses Were Omitted

Tank breathing losses are estimated using the EPA model: TANKS 4.0.9d. The CBR Project DEIR did not include any emissions from the tanks that would store the rail-imported crude.

The CBR Project DEIR describes the Project as replacing 70,000 bbl/day of crude oil delivered by ship with 70,000 bbl/day of crude oil delivered by train. The CBR Project DEIR fails to consider what happens to the crude oil after it is transferred from the rail cars through a new pipeline. DEIR, Sec. 3.2. It simply states that the contents of each tank car will be pumped "into storage tankage located in the Refinery's crude oil storage tank field." DEIR, p. 3-20. This crude oil will be stored in existing storage tanks. As the imported crude oil will have a higher vapor pressure than current crude oils stored in these tanks, ROG and TAC emissions from the tanks will increase. The VIP EIR did not evaluate these emission increases. The CBR Project DEIR also does not include these ROG and TAC emissions.

The Project described in the IS/MND included transferring crude oil from rail cars into existing external floating roof tank 1776. This required changing the service of this tank from jet fuel and other refinery products to crude oil. The ROG emissions were estimated with the EPA TANKS 4.0.9d model for a throughput of 70,000 bbl/day and a crude oil RVP of 9.4 psi. The resulting ROG emissions were 39.3 lb/day and 7.18 ton/yr. The net ROG emission increase, relative to December 2009 through November 2012 baseline, was 23.7 lb/day and 4.33 ton/yr. DEIR, Appx. E.3 (2/13 Application, Table 3-2). The supporting calculations for these emission increases (in Appendix B to the February 2013 Application, provided in DEIR, Appx. E.3, Attachments B-1 and B-2) were withheld from the DEIR as confidential business information (CBI).

The Project was modified in November 2013 to replace Tank 1776 with Tanks 1701 through 1708 (S-57 through S-62). These are existing external floating roof tanks that are currently permitted to store crude oil and have historically stored crude oil delivered by both ship and pipeline. DEIR, Appx. E.4 (11/13 Application, p. 6). Thus, the baseline emissions from these tanks include both San Joaquin Valley crudes and ANS and other ship-imported crudes. These tanks are not in the Title V permit for the Valero Refinery, but rather in the Title V Permit for NuStar Logistics, L.P., Facility B5574. The November 2013 Application incorrectly asserts that these tanks are neither altered nor modified sources and thus are not subject to Authority to Construct and New Source Review requirements for the CBR Project. DEIR, Appx. E.4 (11/13 Application, p. 7). The November 2013 Application at p. 7 (DEIR, Appx. E.4) asserts:

"Changes in material stored. The tanks are currently permitted to store crude oil received by marine vessels and pipeline. With the implementation of this project, the tanks will continue to store crude oil. The crude oil will be received from rail cars, as well as from marine vessels and pipeline. Tanks 1701 through 1706 have historically stored crude oil delivered by ships and pipeline. Tanks 1707 and 1708 were recently constructed and were permitted under NSR to store crude oil. These tanks currently comply with all the requirements in Regulation 8, Rule 5, and associated permit conditions."

Similarly, the DEIR argues (DEIR, p. 4.1-17):

"Nor would the Project cause any emissions increases from storage tanks. Currently, the Refinery stores crude oil delivered by ship and pipeline in eight existing storage tanks numbered 1701 through 1708. Crude oil delivered by rail would be stored in the same tanks. The tanks would not be modified, and would continue to be subject to the same throughput limit and other permit conditions."

Thus, the DEIR does not include any ROG or TAC emissions from these tanks. However, this assertion is invalid, as explained above. The basis of this argument is that "Valero must blend crude feedstocks to a narrow range of weight and sulfur content before they can be processed into marketable products. Because the crude oil blends cannot become significantly heavier or lighter, nor contain significantly more sulfur, there would be no increase in processing emissions." DEIR, p. 4.1.17. This is immaterial as to ROG and TAC emissions because they do not depend on weight and sulfur content of the crude, but rather on vapor pressure and TAC speciation of the crude. These are not related to the gravity or sulfur content of the crude oil.

The ROG and TAC emissions from the receiving storage tanks would increase if 70,000 bbl/day of ship-imported or pipeline-imported crude were replaced with 70,000 bbl/day of rail-imported crude. The DEIR is deficient for failing to include any estimate of these emission increases and for withholding all information required to estimate these emissions, information that is never classified as CBI in public documents—vapor pressures, tank characteristics, baseline emissions, etc.

An approximate estimate of the increase in daily ROG emissions can be made from the previously reported daily ROG emissions for Tank 1776. The IS/MND estimated daily ROG emissions of 39.3 lb/day for a 70,000 bbl/day throughput of crude with an RVP of 9.4 psi. The RVP of the baseline crude in the seven storage tanks that would be used is unknown. However, the DEIR indicates that it is either San Joaquin Valley crude (pipeline) or Alaska North Slope lookalikes.

First, assuming the baseline crude has an RVP equal to that for Alaska North Slope crude, or 6.3 psi,[36] the baseline ROG emissions for 70,000 bbl/day would be **26.3 lb/day**.[37] The increase in ROG emissions, from storing 70,000 bbl/day of Bakken crude in the same tank(s), assuming the reported upper-bound vapor pressure for Bakken crude (15.5 psi)[38] would be **64.8 lb/day**.[39] Thus, the net increase in ROG emissions from replacing 70,000 bbl/day of ship-imported ANS with 70,000 bbl/day of rail-imported Bakken is **38.5 lb/day** (64.8 - 26.3 = 38.5). The corresponding net increase in annual emissions would be **7.0 ton/year**[40] if all of the rail-imported crude were Bakken. This is a reasonably foreseeable scenario as crudes required to blend 100% Bakken to an ANS-lookalike crude could be imported by marine vessel

Second, assuming the baseline crude has an RVP equal to that of San Joaquin Valley crude or other similar heavy sour crudes, 0.04 psi,[41] the baseline ROG emissions for 70,000 bbl/day would be **0.2 lb/day**.[42] As detailed above, the increase in ROG emissions, from storing 70,000 bbl/day of Bakken crude in the same tank(s), assuming the reported upper-bound vapor pressure for Bakken crude (15.5 psi)[43] would be **64.8 lb/day**.[44] Thus, the net increase in ROG emissions from replacing 70,000 bbl/day of pipeline-imported San Joaquin Valley or other similar heavy sour crudes with 70,000 bbl/day of rail-imported Bakken is **64.6 lb/day** (64.8 - 0.2 = 64.6). The corresponding net increase in annual emissions would be **11.8 ton/year** if all of the rail-imported crude were Bakken. This is a reasonably foreseeable scenario as crudes required to blend 100% Bakken to an ANS-lookalike could be imported by marine vessel.

The resulting daily net increase in ROG emissions for a San Joaquin Valley or other similar heavy crude baseline, but otherwise assuming all of the CBR Project DEIR's emissions, is 56 lb/day, as shown in Table 2. This increase in ROG emissions is significant, as it exceeds

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[36] ExxonMobil Refining and Supply Company, ANS11U. Available at: http://www.exxonmobil.com/crudeoil/about_crudes_ans.aspx and http://www.exxonmobil.com/crudeoil/download/ans11u.pdf.

[37] Baseline ROG emissions from storage of 70,000 bbl/day of ANS in one or more of existing tanks 1701 - 1708 = (39.3 lb/day) (6.3 psi/9.4 psi) = **26.3 lb/day**.

[38] Classification and Hazard Communication Provisions for Crude Oil – Bakken Crude Oil Data, June 13, 2014.

[39] Increase in POC emissions from storing 70,000 bbl/day of Bakken crude in one or more of existing tanks 1701-1708 = (39.3 lb/day)(15.5 psi/9.4 psi) = **64.8 lb/day.**

[40] Increase in annual emissions = (38.5 lb/day)(365 days/year)/(2000 lb/ton) = **7.02 ton/yr.**

[41] Emission Calculation Protocol for Oil Production Tanks, September 1, 2000.

[42] Baseline ROG emissions from storage of 70,000 bbl/day of ANS in one or more of existing tanks 1701 - 1708 = (39.3 lb/day) (0.04 psi/9.4 psi) = **0.17 lb/day**.

[43] Classification and Hazard Communication Provisions for Crude Oil – Bakken Crude Oil Data, June 13, 2014.

[44] Increase in ROG emissions from storing 70,000 bbl/day of Bakken crude in one or more of existing tanks 1701 - 1708 = (39.3 lb/day)(15.5 psi/9.4 psi) = **64.8 lb/day.**

the BAAQMD CEQA significance threshold[45] of 54 lb/day and triggers New Source Review thresholds that require Best Available Control Technology. This is a significant impact that was not disclosed in the DEIR. The total Project increase would be even greater than the emissions in Table 2, which do not include ROG increases from other omitted sources, discussed below.

Table 2: Revised Annual and Daily Net Operational ROG Emissions
San Joaquin Valley Crude Baseline

Source	ROG (ton/year)	ROG (lb/day)
Unloading Rack & Pipeline Fugitive Components	1.88	10.30
Locomotives	1.70	9.32
Storage Tank (SJV Crude Baseline)	***11.79***	***64.60***
Marine Vessels (Displaced Baseline)	-5.18	-28.38
Total Net Emissions	**10.19**	**55.83**
BAAQMD CEQA Significance Threshold	10	54
Significant?	**YES**	**YES**

The increase in ROG emissions in Table 2 would be accompanied by an increase in TAC emissions, which are estimated by multiplying the ROG emission increase by the weight percent of each TAC in the ROG emissions (i.e., the TAC speciation profile). The contribution of TAC emissions from these tanks were not included in the DEIR's health risk assessment, which only evaluated diesel particulate matter and PM2.5.

Because the Project would result in significant ROG emissions, the lead agency is required to examine the impact of the increase in localized ROG emissions on ambient air quality and the local community and identify mitigation that is capable of reducing or eliminating these impacts to below a level of significance. To mitigate the Project's significant ROG emissions, the City should consider feasible mitigation measures such as the use of zero-leak fugitive components; use of geodesic domes on external floating roof tanks, which are commonly used on tanks that store RVP 11 crude oils; cable-suspended, full-contact floating roofs; and the use geodesic domes on the existing fixed roof tanks.[46]

[45] BAAQMD Proposed Air Quality CEQA Thresholds of Significance, May 3, 2010, Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Summary_Table_Proposed_BAAQMD_CEQA_Thresholds_May_3_2010.ashx?la=en.

[46] See, e.g., Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project, September 6, 2013, Draft Negative Declaration (Carson Neg. Dec.), Available at: https://www.aqmd.gov/CEQA/documents/2013/nonaqmd/Draft_ND_Phillips_66_Crude_Storage.pdf and City of Richmond, Chevron Refinery Modernization Project DEIR (Chevron DEIR), Chapter 4.3, pp. 4.3-92, Available at: http://chevronmodernization.com/wp-content/uploads/2014/03/4.3_Air-Quality.pdf.

2. Roof Landing, Degassing, and Cleaning Emissions Were Omitted

The increase in ROG emissions estimated above is based on an adjustment of a calculation in the IS/MND based on EPA's TANKS 4.0.9d model (TANKS). However, this model only estimates rim seal losses, withdrawal losses, deck fitting losses, and deck seam losses. It does not estimate roof landing losses, inspection losses, or flashing losses. Thus, it underestimated tank emissions. Therefore, the above estimate of the increase in ROG emissions in Table 2 is an underestimate. These additional emissions should be estimated, added to other tank emissions, and mitigated when the DEIR is revised.

The Project involves seven existing external floating roof tanks configured to comply with BAAQMD Regulation 8-5. DEIR, p. 3-5. These tanks are pontoon-type tanks. DEIR, Appx. E.4 (2/13 Application, p. 1-8). Pontoon tank roofs are supported on legs. In floating roof tanks with leg-supported roofs, the roof floats on the surface of the liquid inside the tank and reduces evaporative losses during normal operations. However, when the tank is emptied, the roof sits on the legs and is essentially uncontrolled.

The EPA has explained that the TANKS model does not include roof landings, and recommended that they be estimated with the equations in AP-42. In other words, the EPA TANKS model estimates evaporative emissions for normal operations only, *i.e.*, it assumes that the floating tank roof is always floating.[47] However, when a tank is emptied to the point that the roof no longer floats on the liquid but lands on deck legs, evaporative losses occur.

> After the floating roof is landed and the liquid level in the tank continues to drop, a vacuum is created which could cause the floating roof to collapse. To prevent damage and to equalize the pressure, a breather vent is actuated. Then, a vapor space is formed between the floating roof and the liquid. The breather vent remains open until the roof is again floated, so whenever the roof is landed, vapor can be lost through this vent.[48]

These losses are called "roof landing losses."

In addition, "degassing and cleaning losses" occur when tanks are drained and degassed for inspection and/or cleaning. These include both roof landing emissions, complete tank

[47] EPA, TANKS Software Frequent Questions, Updated February 2010, Available at: http://www.epa.gov/ttnchie1/faq/tanksfaq.html. ("How can I estimate emissions from roof landing losses in the tanks program? ... In November 2006, Section 7.1 of AP42 was updated with subsection 7.1.3.2.2 Roof Landings. The TANKS program has not been updated with these new algorithms for internal floating roof tanks. It is based on the 1997 version of section 7.1.").

[48] EPA, AP-42, Chapter 7.1 Organic Liquid Storage Tanks, November 2006, Available at: http://www.epa.gov/ttn/chief/ap42/ch07/final/c07s01.pdf.

degassing, and emissions from cleaning out accumulated sludge. These emissions are essentially uncontrolled tank emissions.[49]

The tank cleaning emissions could be substantially higher for Bakken crudes than for other types of crude. Bakken crudes leave waxy deposits in pipelines and tanks, which require more frequent cleaning,[50] and thus higher emissions, than the crudes they would replace. Environmental impacts from chemical dispersants used to control these waxy deposits in tanks and pipelines also should be evaluated.

The EPA recommends methods to estimate emissions from degassing and cleaning and roof landing losses.[51] The method for estimating emissions depends on the construction of the tank, *e.g.*, the flatness of the tank bottom and the position of the withdrawal line (the so-called liquid "heel"). Degassing, cleaning, and roof landing losses continue until the tank is refilled to a sufficient level to again float the tank roof. Total ROG emissions from floating roof tanks during a roof landing is the sum of standing idle losses and filling losses. They can be estimated using formulas contained in EPA's *Compilation of Air Pollutant Emission Factors* ("AP-42"), Chapter 7.1, Organic Liquid Storage Tanks, Section 7.1.3.2.2. These emissions are routinely included in emission inventories. They are required to be reported, for example, in Texas.[52] They are also included in the emission inventory for Tesoro's Vancouver Terminal, which imports similar crudes by rail, and stores them in tanks.[53]

To reduce emissions from tank breathing losses (Comment II.B.1), degassing, cleaning and roof landing losses, the City should require the Applicant to install geodesic domes on the tanks that would store rail-imported crudes, thus avoiding emissions from these and other tank sources.

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[49] See EPA guidance on estimating these emissions at: http://www.epa.gov/ttnchie1/faq/tanksfaq.html#13 .

[50] Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013. Available at: http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html.

[51] "How Can I Estimate Emissions from Degassing and Cleaning Operation During a Tank Turnaround? And How Can I Estimate Emissions from Roof Landing Losses in the TANKS Program:?". Available at: http://www.epa.gov/ttnchie1/faq/tanksfaq.html#13 .

[52] Memorandum from Dan Eden, Deputy Director, Office of Permitting, Remediation, and Registration; David C. Schanbacher, Chief Engineer; and John Steib, Deputy Director, Office of Compliance and Enforcement, Re: Air Emissions During Tank Floating Roof Landings, December 5, 2006. Available at: http://www.tceq.state.tx.us/assets/public/permitting/air/memos/tank_landing_final.pdf .

[53] Tesoro Savage, Application for Site Certification Agreement, Section 5.1.2.1.4. Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%201/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%201.pdf .

Over 10,000 aluminum domes have been installed on petrochemical storage tanks in the United States.[54] The ExxonMobil Torrance Refinery: "completed the process of covering all floating roof tanks with geodesic domes to reduce volatile organic compound (VOCs) emissions from facility storage tanks in 2008. By installing domes on our storage tanks, we've reduced our VOC emissions from these tanks by 80 percent. These domes, installed on tanks that are used to store gasoline and other similar petroleum-derived materials, help reduce VOC emissions by blocking much of the wind that constantly flows across the tank roofs, thus decreasing evaporation from these tanks."[55]

A crude storage project, recently proposed at the Phillips 66 Los Angeles Carson Refinery, required external floating roof tanks with geodesic domes to store crude oil with an RVP of 11.[56] Carson Neg. Dec. Table 1-1. The ConocoPhillips Wilmington Refinery added a geodesic dome to an existing oil storage tank to satisfy BACT.[57] Similarly, Chevron proposes[58] to use domes on several existing tanks to mitigate VOC emission increases at its Richmond Refinery.[59] The U.S. Department of Justice CITGO Consent Decree required a geodesic dome on a gasoline storage tank at the Lamont, Texas refinery.[60] Further, numerous vendors have provided geodesic domes for refinery tanks.[61] The crudes that would be stored in the Project tanks have vapor pressures that are comparable to gasoline (TSBC 2013, Sec. 3.2.7), justifying the use of geodesic domes to control tank emissions.

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[54] M. Doxey and M. Trinidad, Aluminum Geodesic Dome Roof for Both New and Tank Retrofit Projects, Materials Forum, v. 30, 2006, Available at: http://www.materialsaustralia.com.au/lib/pdf/Mats.%20Forum%20page%20164_169.pdf.

[55] Torrance Refinery: An Overview of our Environmental and Social Programs, 2010, Available at: http://www.exxonmobil.com/NA-English/Files/About_Where_Ref_TorranceReport.pdf.

[56] See, e.g., Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project, September 6, 2013, Table 1-1, Draft Negative Declaration, Available at: https://www.aqmd.gov/CEQA/documents/2013/nonaqmd/Draft_ND_Phillips_66_Crude_Storage.pdf.

[57] SCAQMD Letter to G. Rios, December 4, 2009, Available at: http://yosemite.epa.gov/r9/air/cpss.nsf/e0c49a10c792e06f8825657e007654a3/e97e6a905737e9bd882576cd0064b56a/$FILE/ATTTOA6X.pdf/ID%20800363%20ConocoPhillips%20Wilmington%20-%20EPA%20Cover%20Letter%20%20-AN%20501727%20501735%20457557.pdf.

[58] City of Richmond, Chevron Refinery Modernization Project, Environmental Impact Report, Volume 1: Draft EIR, March 2014 (Chevron DEIR), Available at: http://chevronmodernization.com/project-documents/ .

[59] Chevron DEIR, Chapter 4.3.

[60] CITGO Petroleum Corp. Clean Air Act Settlement, Available at: http://www2.epa.gov/enforcement/citgo-petroleum-corporation-clean-air-act-settlement.

[61] See, e.g., Aluminum Geodesic Dome, Available at: http://tankaluminumcover.com/Aluminum-Geodesic-Dome; Larco Storage Tank Equipments, Available at: http://www.larco.fr/aluminum_domes.html; Vacono Dome, Available at: http://www.easyfairs.com/uploads/tx_ef/VACONODOME_2014.pdf; United Industries Group, Inc., Available at: http://www.thomasnet.com/productsearch/item/10039789-13068-1008-1008/united-industries-group-inc/geodesic-aluminum-dome-roofs/.

3. Tank Flashing Emissions Were Omitted

Most Bakken crudes are transported raw, without stabilization, due to the lack of facilities in the oil fields, as discussed elsewhere in these Comments. Unstabilized or "live" crude oils have high concentrations of volatile materials entrained in the bulk crude oil. Tank flashing emissions occur when these crude oils, such as Bakken, are exposed to temperature increases or pressure drops. When this occurs, some of the compounds that are liquids at the initial pressure/temperature transform into gases and are released or "flashed" from the liquid. These emissions are in addition to working and breathing emissions from tanks and are not estimated by the EPA TANKS 4.0.9d model. These emissions can be calculated using standard procedures.[62] The DEIR did not mention or calculate these emissions, nor does it include permit conditions that would allow only stabilized crude oils to be received.

4. Water Draw Tank Emissions Were Omitted

Crude oil typically contains small amounts of water, which is separated from the crude oil and accumulates in the bottom of storage tanks. This accumulated water, referred to as water draw, is typically transferred from the crude oil storage tanks into a smaller water draw surge tank for processing prior to disposal. Over time, a thick layer of crude oil forms in the water draw surge tank. The water draw surge tank and processing of wastewaters from it emit ROG and TACs. The DEIR does not mention water draw, or include emissions from storing or processing it, which would increase as the vapor pressure of the stored crude increases, i.e., as from a switch from San Joaquin Valley to Bakken crude.

C. Rail Car Unloading Emissions Were Omitted

The Project includes a rail car unloading rack capable of unloading two parallel rows of 25 crude oil rail cars simultaneously. DEIR, p. ES-3. The DEIR does not disclose any emissions from the unloading process, while EIRs for other similar facilities such as the proposed Phillips 66 CBR Project in Santa Maria, report unloading emissions.[63]

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[62] See, e.g., calculation methods at: Paul Peacock, Marathon, Bakken Oil Storage Tank Emission Models, March 23, 2010; TCEQ, Air Permit Reference Guide APDG 5941, Available at: http://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/guidance_flashemission.pdf; Kansas Dept. of Health & Environment, Available at: http://www.kdheks.gov/bar/download/Calculation_Flashing_Losses_Handout.pdf; B. Gidney and S. Pena, Upstream Oil and Gas Storage Tank Project Flash Emissions Models Evaluation, July 16, 2009, Available at: http://www.bdlaw.com/assets/htmldocuments/TCEQ%20Final%20Report%20Oil%20Gas%20Storage%20Tank%20Project.pdf.

[63] Marine Research Specialists (MRS), Phillips 66 Company Rail Spur Extension Project Public Draft Environmental Impact Report and Vertical Coastal Access Assessment, November 2013; p. 2-14, Available at: http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/Draft+EIR-Phillips+66+Rail+Spur+Extension+Project+(November+2013)/Full+EIR+-+Large+File/p66.pdf.

At Valero, each side of the rack would have 25 unloading stations, which would "bottom-unload" closed-dome tank cars using 4-inch-diameter hoses, with dry disconnect couplings that would connect to a common header between the two sides of the rack (a check valve, connected to the top of each tank car via 2-inch-diameter hose would open to allow ambient air to enter during unloading and immediately close when unloading is finished). DEIR, p. 3-2.

A check valve would be installed onto each vent valve on the top of each tank car. The vent valve on the top of each tank car would be opened and the accompanying check valve would only allow fresh air into each tank car, and would prevent release of hydrocarbon fugitive emissions to the atmosphere. At each end car and on approximately every 8 tank cars in the 25 tank car string, a hose would be connected from the tank car's vent connection to a separate "equalization header." The equalization header would ensure the vapor spaces above the stored liquid crude in the tank cars is equalized between the tank cars. Individual drain hoses would be manually connected to the bottom of each tank car by on-site workers. The contents of each tank car would be drained by gravity into a collection pipe (collection header) and then pumped directly into storage tanks. DEIR, p. 3-21.

A typical rail car unloading system is described differently in the Santa Maria Rail DEIR. Santa Maria DEIR, p. 2-14. In that DEIR, the rail car unloading system consists of an adapter unit that connects the rail car to couplings, hoses, valves and piping that connect to a positive displacement pump. Air and crude oil vapors are commonly mixed in with crude oil, from loading and evaporation during transit. These vapors can present an explosion risk for downstream equipment and are typically removed with air eliminators. As the vapors contain high concentrations of ROG and TACs, they are typically routed to carbon columns or an incinerator to control the emissions.

The Valero CBR Project DEIR does not mention these vapors, an air eliminator, or indicate how they will be controlled. The Valero CBR Project DEIR only notes that "the BAAQMD will consider locomotive emissions and tank car unloading emissions as may be caused by the Project." DEIR, p. 3-2. This is not adequate. If unloading emissions will occur, at an air eliminator or other release point, the DEIR should be modified to describe them and to quantify them. If they are not present, the DEIR should explain how the explosion hazard typically associated with unloading cargos such as Bakken crude will be addressed as it is not clear that the air equalization system would eliminate this hazard.

D. Sump Emissions Were Omitted

The unloading facility includes a liquid spill containment sump with the capacity to contain the contents of at least one tank car. DEIR, p. ES-2. Crude oil that spills into this sump

would release vapors including ROG and TAC emissions. The DEIR did not include these emissions.

E. Rail Car Fugitive Emissions Were Omitted

ROG and TACs will be emitted from rail cars from their point of origin through unloading as rail cars are not vapor tight. The DEIR did not include these emissions.

The crude oil would be shipped in tank cars, such that the volume of loaded crude oil shipped is less than the capacity of the rail car to accommodate expansion during shipping. This volume reduction creates free space at the top of the tank car, which provides space for entrained gases to be released from the crude oil[64] and emitted to the atmosphere during transit and idling in rail yards.[65]

As rail cars are not vapor tight, these vapors in the head space above the oil are emitted to the atmosphere during rail transport and at the unloading terminal. Further, most Bakken crudes are shipped live as discussed earlier. These crudes will flash in the tank cars when exposed to temperature increases or pressure drops, causing valves to open, emitting ROG and TACs.

These losses are consistent with the well-known "crude shrinkage" issue associated with crude by rail. The crude delivered is significantly less than the crude loaded. The reported range in crude shrinkage is 0.5% to 3% of the loaded crude.[66] Some of this shrinkage is likely due to emissions from the rail car during transit. The emissions of ROG and TACs from rail cars has been confirmed by field measurements.[67] The DEIR did not include these ROG and TAC emissions in its emission calculations or the health risk assessment.

Tank cars have domes to allow space for the product to expand as temperatures rise. Each dome has a manhole through which the tank car can be loaded, unloaded, inspected, cleaned, and repaired. Dome covers may be hinged and bolted on or screwed on. Most domes

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[64] Anthony Andrews, Congressional Research Service, Crude Oil Properties Relevant to Rail Transport Safety: In Brief, February 18, 2014, pp. 8-9.

[65] A DOT 111 (or comparable) tank car generally has a capacity of 34,500 gallons or 263,000 lbs. gross weight on rail. Under some conditions, the maximum gross weight can be increased to 286,000 lbs. At an API gravity of 50°, a tank car can hold its maximum volume of 31,800 gallons and not exceed the 286,000 lb gross weight on rail limit. As the API gravity drops, the amount of oil that can be carried must also drop. Thus, a tank car of Bakken crude, at its highest density of 39.7° API, can only hold 30,488 gallons, a volume reduction of about 1,300 gallons. Further, as crude oil density (and thus API gravity) is temperature dependent, volume will increase as temperature increases. Thus, the shipper may have to reduce the shipped volume even further. This volume reduction creates a space above the crude oil where vapors accumulate.

[66] Alan Mazaud, Exergy Resources, Pennsylvania Rail Freight Seminar, May 23, 2013, p. 17. Available at: http://www.parailseminar.com/site/Portals/3/docs/Alan%20Mazaud%20Presentation%20-%20AM.pptx

[67] http://www.youtube.com/watch?v=35uC1gLctnw.

have vents and safety valves to let out vapors.[68] Thus, they are sources of ROG emissions that were omitted from the emission calculations. Further, when dome covers are left open, any residual vapors escape to atmosphere. Residual material clings to the bottom and sides of empty rail cars and emits ROG and TAC while the rail cars idle at the site, waiting for the entire unit train to be unloaded. Open covers are common in railyards as they are opened for inspections and repairs. The ROG and TAC emissions from these sources were omitted from the DEIR's emission inventory.

Further, each tank car has a bottom outlet which is used for loading and unloading that includes pumps, manifolds, and valves, all of which leak ROG and TACs. Finally, liquid leaks occur when unloading arms are disconnected, even for the so-called no leak arms proposed for the Project. These disconnect leaks evaporate, contributing to ROG and TAC emissions.

An estimate of these emissions can be based conservatively on the lower end of the range of crude shrinkage (0.5%) discussed above and the maximum freight weight per car of 106 tons from the TRN Spec Sheet-1. DEIR, Appx. E.6 (6/11/14 Memo to Morgan from Velzy, pdf 1208). Assuming 50 cars/train and two unit trains per day, a total of 53 ton/day[69] of ROG can be emitted as the trains traverse the 1500 miles between the shipping point and the Valero rail terminal. Of these 1500 miles, 263 miles are within California.[70] DEIR, Appx. E.5 (Air Quality & GHG Supplement, pdf 1198). Thus, 9.3 ton/day of ROG (18,600 lb/day) can be emitted within California from rail car leakage.[71] Of the 263 miles within California, 22 miles are within the boundary of the BAAQMD. *Ibid.* Thus, 0.8 ton/day (1,555 lb/day) of ROG emissions can be emitted within the BAAQMD.[72] These daily emissions greatly exceed the BAAQMD daily CEQA significance threshold for ROG of 54 lb/day, requiring mitigation.

Additional ROG would be emitted at the Valero railyard, while railcars wait for the entire train to be unloaded, and from the emptied railcars, enroute to the cleaning facility, from residual product that clings to the bottom and sides of the railcars.

These ROG emissions contain the same chemicals found in the crude oil, including benzene, toluene, xylene, hexane, and ethylbenzene. As discussed below, some crudes can contain up to 7% benzene by weight. See Table 3 below. Thus, greater than 1,301 lb/day of benzene could be emitted in California and greater than 109 lb/day of benzene within the

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[68] Chapter 11. Tank Car Operations, Available at: http://www.globalsecurity.org/military/library/policy/army/fm/10-67-1/CHAP11.HTML.

[69] ROG emissions from train transit = (106 ton/car)(50 car/train)(2 train/day)(0.005) = **53 ton/day.**

[70] Distance within California = (136+390)/2 = 263 mi.

[71] ROG emitted within California = (318 ton/day)(263/1500) = **9.3 ton/day.**

[72] ROG emitted within BAAQMD = (318 ton/day)(22/1500) = **0.8 ton/day.**

BAAQMD from rail car leakage. This rail car leakage is much greater than the amount of benzene (and other TACs) included in the HRA. For example, the HRA included only 0.06 lb/day of benzene[73] from fugitive components (DEIR, Appx. E.4, pdf 1160) or a tiny fraction of the 109 lb/day of benzene that could be emitted within the BAAQMD from the rail cars themselves.

These are huge emissions, greatly exceeding the ROG (and HRA) CEQA significance thresholds of the BAAQMD and other air district along the rail route. See DEIR, Tables 4.1-5 and 4.1-6. The City must require mitigation for these ROG and TAC emissions.

III. THE DEIR FAILS TO DISCLOSE AND UNDERESTIMATES TAC EMISSIONS USED IN HEALTH RISK ASSESSMENT

Health Risk Assessments (HRAs) typically contain tables that summarize the amount of each TAC and the corresponding cancer, chronic, and acute health risk due to each. The supporting TAC emission calculations are presented in an appendix. The modelling files are separately attached. The HRA in this DEIR does not include most of this information. (Modelling files are available on a CD, which must be requested.) The supporting emission calculations are incomplete and scattered throughout many appendices with no road map explaining how it all fits together, with many analyses superseded.

There is no evident basis for concluding the Project would not result in a significant health impacts as the results are simply stated without the supporting emission calculations, leaving the reader the chore of digging through thousands of pages of appendices to make guesses at the TAC emissions included in the HRA analysis.

My analysis of this material indicates that the HRA only included diesel particulate matter and PM2.5 emissions from locomotives and TAC emissions from fugitive sources, a comparatively minor source of TAC emissions. The TAC emissions from all other sources (storage tanks, idling rail cars) discussed in Comment II were excluded. The TAC emissions from fugitive sources were underestimated, as explained below.

The unloaded crude oil will be transported from the unloading rack to existing crude supply piping in a 4,000–foot-long pipeline. DEIR, p. 1-2. The connecting system includes 3 pumps, 521 valves, 940 flanges, 295 connectors, and 6 pressure relief valves (plus a 15% contingency for valves, flanges and connectors). DEIR, Appx. E.4-1 (11/13 Application, pdf 1179). Crude oil vapors will be emitted from all of these components. The DEIR estimated TAC emissions from these components by first estimating ROG emissions using CARB

[73] Benzene in fugitive emissions from Ex. E.4, Table 3-5: (2.57E-3 lb/hr)(24 hr/day)/(2000 lb/ton) = **3.1E-5 ton/day.**

emissions factors. The ROG emissions were then multiplied by the weight percent of each TAC in the crude.

The TAC emissions from fugitive components were estimated using the "default speciation profile" for crude oil from the EPA program, TANKS4.09.[74] DEIR, Appx. E.4-1 (11/13 Application, pdf 1179, footnote). A "speciation profile" for a petroleum product identifies each chemical in the liquid and its concentration, reported as volume or weight percent. The default speciation profile used in the DEIR is not representative of the crude oil(s) that could be imported at the rail terminal and is entirely hypothetical. DEIR, Table 3-1. The conclusion that the hypothetical speciation profile is appropriate to evaluate Project health impacts is unsupported.

My review of the HRA speciation profile indicates that it is not based on the maximum amount of each TAC found in the crude oils that could be stored in the tanks. Material Safety Data Sheets (MSDSs) submitted in other applications to import cost-advantaged North American crudes[75] indicate that much higher concentrations of TACs could be present in the crude oils unloaded at the Valero Rail Terminal.

The upper bound values from these MSDSs are summarized in Table 3 and compared with the speciation profile used in the DEIR. This table shows that the HRA significantly underestimated all of the organic TACs included in the HRA. Similar information for diesel particulate matter, the only other TAC included in the HRA, is not available in the documents I reviewed.

[74] Crude oil component speciation data was obtained by using the TANKS409d model available at http://www.epa.gov/ttnchie1/software/tanks/ using the database interface to export the speciation profile for the TANKS default crude oil, *viz.*, "Data --> Speciation Profiles --> Export" menu selection and choosing crude oil. This spreadsheet confirms that the default benzene level for crude oils is 0.6 wt.%.

[75] Tesoro Application to SCAQMD for Tank 80079 Throughput Increase, October 3, 2013, PRN 556835 (10/3/13 Application), MSDS for Light Sweet Crude, pdf 12; Tesoro Savage, Application for Site Certification Agreement, vol. 2, Appendix G: Material Safety Data Sheets, August 29, 2013, Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20II%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%20II.pdf.

Table 3: Comparison of DEIR Draft EIR, Appx. E.4, Table 3-5, HRA Speciation Profile for Fugitive Emissions with Maxima Reported in MSDS(s)[76]

TAC	Weight Percent		
	HRA Speciation Profile[77]	Maxima MSDS	Factor Difference
Benzene	0.6	7	11.7
Ethyl Benzene	0.4	7	17.5
Hexane	0.4	11	27.5
Toluene	1	7	7.0
Xylenes	1.4	7	5.0

Table 3 shows that the risk assessment underestimated the amount of benzene, ethyl benzene, hexane, toluene and xylenes in emissions by factors of 5 (xylenes) to 28 (hexane). Actual TAC emissions, after adjusting for the speciation profile, would be much higher as the DEIR excluded most of the sources of ROG emissions that would contribute TACs. The increase in benzene alone is large enough to increase the cancer risk at the maximum exposed individual worker (MEIW) over the BAAQMD Regulation 2-5 significance threshold of 1 in one million. DEIR, Appx. E.4-1 (11/13 Application, pdf 1189).

The DEIR argues that the benzene content of two Canadian crudes are on average lower than the benzene content of Alaska North Slope crude (0.33%), the design crude for the refinery. DEIR, Appx. K, p. K-17. However, the benzene content of other crudes listed in DEIR Table 3-1 are on average much higher than ANS. Light crudes, like Bakken, have been reported to contain benzene concentrations of up to 7 weight %, or twenty-one times more than the design ANS crude.

In sum, the DEIR fails to properly analyze the health impacts of importing, storing, and refining the crude oil that the CBR Project will likely bring to Valero.

[76] Tesoro Savage, Application for Site Certification Agreement, vol. 2, Appendix G: Material Safety Data Sheets for Enbridge Bakken (n-hexane = 11%); sour heavy crude oil (benzene = 7%; toluene = 7%; ethylbenzene = 7%; xylene = 7%); sweet heavy crude oil (toluene = 7%); light sweet crude oil (benzene = 7%; toluene = 7%; ethylbenzene = 7%; xylene = 7%), August 29, 2013, Available at: http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20II%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%20II.pdf. See also 3/7/13 Revised Application, pdf 96-115.

[77] DEIR, Appx. E.4, Table 3-5, pdf 1160.

THOMSON REUTERS STREETEVENTS

EDITED TRANSCRIPT

PSX - Q3 2013 Phillips 66 Earnings Conference Call

EVENT DATE/TIME: OCTOBER 30, 2013 / 03:00PM GMT

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Doug Terreson, ISI group.

Doug Terreson - *ISI Group - Analyst*

Good morning everybody. I have a couple of questions on refining. First, the Company has significantly increased use advantaged crudes in the past couple of years with significant benefits. While it may be hard to know, I wanted to see whether Greg can talk a little bit about how much running room that the Company may have in this area in coming years. Second, the unfavorable delta for secondary products seemed to increase in each of the major regions, especially on the Gulf Coast and Central Corridor. I think Greg attributed this to rising feed stock costs. I just wanted to see if there was any additional color on that decline, and also whether or not there was anything specific to those regions that caused them to be affected more than the others?

Greg Garland - *Phillips 66 - Chairman and CEO*

I'll take a stab, and then Tim and Greg can kind of help answer the question. If you think about the running room, you know, we plan, Doug, to eventually get to 100% advantaged crude across the refineries. That's some combination of getting more crude East and West because that's where we still have the opportunities. When you think about Bayway and you think about the West Coast refineries, rail is a key piece of that. We're adding capabilities. We're taking more cars. By the end of this year, we think we'll have all the 2,000 cars in place that we've purchased. We're thinking about buying some more rail cars. We certainly have a large project underway at Bayway to be able to unload at Bayway 75 a day. We're trying to get Bayway positioned where we can get it on a pretty steady diet of Bakken. We have the Jones Act vessels where we can run Eagle Ford around to Bayway. We're working that. We've said this for a while that we do think that crudes like LLS become an advantaged crude for us on the Gulf Coast. While today we would lump that in the 500,000 barrels a day of Brent based crude that we're running, ultimately it becomes an advantaged crude. I do think between what ourselves and others are doing on the West Coast, we're going to pressure ANS prices, and so ANS, rather than being a Brent base type crude, it becomes an advantaged crude. They're partly the actions we're taking, and the actions others are taking, that put pressure on some of these crudes. I think we do get to 100% advantaged crude over the next couple of years.

Clayton Reasor - *Phillips 66 - SVP, IR, Strategy, and Corporate Affairs*

Secondary product.

Greg Maxwell - *Phillips 66 - CFO*

Secondary products. Crude prices went up 8% to 12%. TI was up 12%. Brent's up 8% this quarter, over the last quarter. Our prices stayed flat for a lot of the secondary products. That's where we saw the compression.

Tim Taylor - *Phillips 66 - EVP*

Primarily coke and NGL prices did not keep up pace with the crude price.

Doug Terreson - *ISI Group - Analyst*

Okay. Thanks a lot guys.

Operator

Evan Calio, Morgan Stanley.

Evan Calio - *Morgan Stanley - Analyst*

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SOUTH COAST AQMD
CLERK OF THE BOARDS

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COMMUNITIES FOR A BETTER ENVIRONMENT

January 28, 2015

Saundra McDaniel
Clerk of the Boards
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

[Via US Mail]

Re: NOTICE OF INTENT TO FILE CEQA PETITION

Dear Ms. McDaniel,

PLEASE TAKE NOTICE, under Public Resources Code section 21168.5, Communities for a Better Environment ("Petitioner") intends to file a verified petition for writ of mandate and complaint for declaratory and injunctive relief against the South Coast Air Quality Management District ("Air District") in Los Angeles Superior Court. The petition challenges the Air District's approval and certification of the final Negative Declaration for the Phillips 66 Carson Crude Oil Storage Capacity Project ("Project") on December 12, 2014.

The petition seeks a writ of mandate to compel the Air District to comply with CEQA and a writ of mandate directing the Air District and Real Parties in Interest, Phillips 66 and Does 1-20, to take no action in furtherance of this Project unless and until CEQA review is correct and complete. The petit also seeks injunctive relief seeking the Air District's withdrawal of its certification of the Notice of Determination and Project approvals. Finally, the petition seeks declaratory relief stating that the Ai District failed to fulfill its obligation and duty to comply with all applicable statutes and regulations, including CEQA, and that, as a result, all actions taken in connection with approval of the Project are invalid and unlawful.

Sincerely,

Maya Golden-Krasner
Yana Garcia
Staff Attorneys, Communities for a Better Environm

Cc: Dr. Barry Wallerstein, Executive Officer
Kurt Wiese, General Counsel