CHAPTER 4

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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4.0 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 INTRODUCTION

CEQA Guidelines §15126.2 and §15126.4 require an EIR to include a description of the significant environmental effects of a proposed project, significant environmental effects which cannot be avoided, significant irreversible environmental changes, growth-inducing impacts, and mitigation measures proposed to minimize the significant adverse impacts. This chapter assesses the potential environmental impacts of the construction and operation of the Tesoro Los Angeles Refinery Integration and Compliance Project described in Chapter 2.

Chapter 4 evaluates those impacts that were identified as potentially significant under the requirements of CEQA in the NOP/IS (see Appendix A). No comments were received on the NOP/IS that identified any new environmental topic areas that could be adversely affected by the proposed project. An impact is considered significant under CEQA if it leads to a "substantial, or potentially substantial, adverse change in the environment." Impacts from the proposed project are categorized in this analysis as one of the following:

Beneficial – Impacts will have a positive effect on the resource.

No impact – There would be no impact to the identified resource as a result of the proposed project.

Adverse but not significant – Some impacts may result from the project; however, they are judged to be insignificant. Impacts are frequently considered insignificant when the changes are minor relative to the size of the available resource base, would not change an existing resource, or would not exceed significance thresholds established by the lead agency.

Potentially significant but mitigation measures reduce to insignificance – Significant adverse impacts may occur; however, with proper mitigation, the impacts can be reduced to insignificance.

Potentially significant and mitigation measures are not available to reduce to insignificance – Adverse impacts may occur that would be significant even after mitigation measures have been applied to lessen their severity.

4.1.1 PROJECT DIRECT EFFECTS

The proposed project has the potential to generate significant adverse direct impacts to environmental resources. Impacts are considered to be direct if they produce direct physical changes or alterations to ecological systems (e.g., air quality, hazards and hazardous materials, hydrology and water quality, noise, solid and hazardous waste, and transportation and traffic).

The potential direct impacts from the proposed project components described in Section 2.7 of the project description are analyzed in this Chapter.

4.1.2 DOWNSTREAM EFFECTS

In addition to direct impacts, the proposed project may have indirect impacts on downstream equipment by causing increased utilization from operational changes, even though the equipment is not part of the proposed project, that is, it is not modified in any way, is operating within existing permit limits and no permit modification would be required. Due to the nature of Refinery operations, all equipment activity levels may continue to fluctuate on a monthly or even daily basis. While the proposed project does not affect the types of crude oils processed at the Refinery and, thus, will not have impacts due to changes in crudes, the proposed project may increase downstream unit processing rates on a monthly or daily basis. Such indirect impacts are expected to occur in the following units; Wilmington Operations units downstream of the Coker (from H-100 duty increase and potential crude capacity increase) and tanks; and, Carson Operations FCCU, Cogeneration (Cogen) Unit, and tanks. The anticipated indirect operational changes are described below and are included as part of the analysis of operational impacts, e.g., operational emission impacts are included in Subsection 4.2.2.2. All mobile source emission impacts from the proposed project have been accounted for as direct emissions impacts. After careful review of the proposed project, no other indirect air quality impacts were identified.

4.1.2.1 Indirect Impacts from Downstream DCU H-100 Duty Resulting from Increase/Potential Crude Capacity Increase (Wilmington Operations)

As summarized in Subsection 2.1.7.3, in order to ensure that all impacts of the modification to the Refinery are fully analyzed, the potential impacts from a previously submitted permit application to revise the permit description of Wilmington Operations DCU heater H-100 to conform to SCAQMD/Industry standards has been included in the proposed project. The description will be changed from the 'design heat release' basis (252 mmBtu/hr) to the industry standard 'maximum heat release' basis (302.4 mmBtu/hr). This revision of the permit description does not involve any physical modifications, but would increase use of the heater which will enable more efficient production of gas oil and distillates from the feed to the DCU. Although the described duty of the heater will increase to 302.4 mmBtu/hr, there will be no increase in peak daily emissions as permit conditions will be imposed to limit criteria pollutant emissions. Mass emissions of NOx, SOx, PM10, CO and VOC will be restricted in the revised permit.

This revision of the permit description would allow production of additional heat from H-100 which is expected to be used to produce more gas oil from residual oil in the DCU fractionator and vacuum towers and could also result in a small increase in crude oil throughput capacity of up to two percent (or up to 6,000 bbl/day). Alternatively, the additional heat from H-100 could be used to get more overhead production from the DCU fractionator and to enable more efficient recovery of distillate product, or to process a slightly heavier crude oil blend. Any crude oil blend processed would be within the existing crude oil operating envelope that is addressed in Section 2.9 and Appendix F, the McGovern Report. Processing a slightly heavier crude oil blend would only result in additional impacts from H-100 in the DCU and a slight increase in coke

production and handling. However, the impacts from the increase in crude oil throughput of up to 6,000 bbl/day will result in greater environmental impacts downstream of the DCU due to increased emissions associated with increased firing of heaters in the downstream process units. Processing increased crude oil throughput in the H-100 heater will have downstream impacts associated with processing all the various hydrocarbon fractions in crude oil. The light ends will go overhead in the distillation column downstream of the H-100 heater and cascade through downstream process units (e.g., HTU-3, CRU-2, and the Sulfur Recovery Plant) as further described below and in Table 4.1-1. Comparatively, the ability to process heavier crude oil blends would only impact one unit, the DCU. No further impacts on the DCU are expected since Tesoro is not modifying downstream DCU equipment (i.e., coke drums) or operation (e.g., cycle time of the coke drums) (see Section 2.5.4.1). Thus, this scenario of an increase in crude oil throughput of up to 6,000 bbl/day is analyzed as a worst-case analysis. Therefore, the downstream impacts of increasing the duty of the H-100 heater, including the potential crude oil throughput capacity increase are included in the analysis of project operational impacts.

Tesoro used its proprietary Linear Program model of refinery processes (see Section 2.5.3) to predict the impacts of increasing Wilmington Operations crude and crude feedstocks capacity by 6,000 bbl/day. The Linear Program model was run to assess the configuration and constraints of the Refinery under currently operating conditions compared to operating conditions once the proposed project becomes operational. The results of the Linear Program model showed that many of the downstream units were at capacity under current conditions and there was little change in the utilities (e.g., water and electricity) used on the units that were at full rates. The units where the increased crude throughput had a downstream effect were the DCU fractionation tower, the DCU, HTU-3 (Distillate Hydrotreater) and the CRU-2 (#2 Reformer). There was also a minor increase in operation of the Sulfur Recovery Plant due to the increased crude oil throughput rate. With the key conversion units currently at capacity, the Linear Program model predicted less premium gasoline production from Wilmington Operations once the proposed project is implemented. This is because the increased throughput would not result in an increase in the production of octane that is required to make premium gasoline, but could result in an increase in crude oil throughput to produce regular gasoline. The Linear Program model was used to predict any increases in downstream unit heater firing rates along with unit rates and other process variables for those units that are not currently operating at capacity, as shown by the results of the Linear Program model. All of the indirect impacts from increased utilization are analyzed in this EIR.

The increases in fired duty identified by the Linear Program model are presented in Table 4.1-1. The increases identified in Table 4.1-1 were used to analyze potential operational air quality and water demand impacts (see Section 4.4), as these were the only environmental topic areas identified that could be adversely affected by changes in fired duty from the proposed project.

TABLE 4.1-1

Increased Utilization

Unit	Heater	Duty Increase (mmBtu/hr)
Wilmington DCU	H-101	7.0
Wilmington HTU-3	H-30	4.1
Wilmington HTU-3	H-21/22	4.1
Wilmington CRU-2	H-510	0.4
Wilmington CRU-2	H-501A/501B/502/503/504	1.6
Wilmington Boilers	Boilers 7/8/9/10	10.0
Sulfur Recovery Plant	H-1601/1602	0.125
Sulfur Recovery Plant	F-704 Incinerator	N/A; 3 LTPD of sulfur increased production
Sulfur Recovery Plant	F-754 Incinerator	N/A; 3 LTPD of sulfur increased production

N/A = not applicable; LTPD = Long tons per day (2,240 lb/day)

4.1.2.2 Increased Utilization of Carson Operations Cogeneration Facility

The proposed project is expected to result in an increase in steam demand primarily to process amylenes (C5 olefins) in the Carson Operations Alkylation Unit. Processing amylene in the Carson Alkyation Unit enables propylene and butylene feedstocks to be sent to the Wilmington Alkylation Unit, since the Wilmington Alkylation Unit loses a source of feedstock with the shutdown of the Wilmington FCCU. The increased separation of feedstock and associated increased steam demand is expected to occur at the Carson Operations and would result in an increase in utilization of the existing Watson Cogeneration Facility (Cogen) post-project compared to average utilization in 2012 and 2013. The proposed project will increase steam demand from 2012/2013 baseline levels by approximately 30,000 pounds per hour (lb/hr), which requires approximately 42 mmBtu/hr of increased duct burner firing. The steam demand of the proposed project does not require any physical modification to the Cogen or permit modification. However, the potential impacts from the incremental steam increase associated with the proposed project are evaluated in this chapter.

4.1.2.3 Increased Utilization of the Carson Operations FCCU

Modifications are proposed within both Carson and Wilmington Operations, which would allow the Carson Operations FCCU to receive additional gas oil feed from Wilmington Operations. The gas oil will be available due to the Wilmington Operations FCCU shutdown. Compared to the baseline, the peak day operations and operational emissions from the Carson Operations FCCU will not change. However, the average annual feed is projected to increase by approximately 365,000 bbl/year. Therefore certain impacts, such as GHG emissions will increase when considered on an annual basis and are analyzed herein.

Once the proposed project becomes operational, the Carson Operations FCCU is expected to operate more consistently at its recent demonstrated capacity of 102,500 bbl/day. This is the unit's baseline peak daily operating rate, which has been achieved frequently in the past. The design rate of 105,000 bbl/day has been achieved in the past, though less frequently. Two major

factors that will support consistently operating the Carson Operations FCCU at its demonstrated capacity are: 1) consistently providing gas oil feed from Wilmington Operations and 2) recovering distillate from gas oil streams so that the Los Angeles Refinery balances the available gas oil with the production requirement for gas oil (i.e., to be in balance). The first factor will enable the Los Angeles Refinery to discontinue or reduce purchasing gas oil from external third-party sources in order to keep the FCCUs operating near capacity. The second factor is important so that there is not an excess of gas oil that cannot be processed into finished fuels.

4.1.2.4 Increased Utilization of Existing Tanks at Carson and Wilmington Operations

Tesoro evaluated existing and incremental increased tank usage from existing tanks at both Carson and Wilmington Operations with consideration given to commodities and throughputs that would be transferred and stored post-project and that would increase emissions. Increases in tank usage include: 1) transfers between Carson and Wilmington Operations that are not currently occurring, but that will be made when the Interconnecting Pipelines are complete; and, 2) additional product and intermediate feedstocks associated with increased unit rates that may result from increase in crude oil (i.e., 6,000 bbl/day) processed at the Wilmington Operations DCU. Increased tank usage was evaluated compared to permit limitations. If physical or permit modifications were required to existing tanks; the tank modifications were included as part of the proposed project (included in the direct impact analysis). Additionally, if the proposed project would increase usage of an existing tank compared to baseline operations, but a physical or permit modification is not required, the increased emissions are also evaluated in this chapter (included in the indirect impact analysis).

4.1.2.5 Other Projects

As noted in Section 2.1, the SCAQMD previously released a Notice of Intent to adopt a Draft Negative Declaration (ND) for the Tesoro Storage Tank Replacement and Modification project. One of the public comments made on the Storage Tank Replacement and Modification project ND was that it was part of a larger project to transport crude oil from the Bakken region by rail to a proposed Vancouver Energy Terminal in the state of Washington and then by marine vessel to the Los Angeles Refinery. The Vancouver Energy Terminal project is an independent project undergoing separate environmental review by the Energy Facility Site Evaluation Council (EFSEC) in the state of Washington, and has not been approved and there is no guarantee that the terminal will be approved or constructed. The Vancouver Energy Terminal is being proposed by Vancouver Energy, a joint venture between Tesoro Refining & Marketing Company LLC and Savage Companies. The Proposed Vancouver Energy Project would offer the transport of crude oils to any of the refineries located on the West Coast regardless of ownership, not just Tesoro refineries. The proposed Vancouver Energy Terminal project is unrelated to the replacement of crude oil tanks or the Tesoro Refinery Integration and Compliance project because it could go forward with or without the currently proposed project; that is, neither project relies on the other project to be implemented. Similarly, Bakken crude oil is currently transported by rail to refineries and unloading facilities on the East and West Coasts. Consequently, transport of Bakken crude oil would continue to occur with or without constructing the Vancouver Energy Terminal. Regardless of the source of crude oil acquired to be processed in the Refinery, the proposed replacement of the crude oil tanks will proceed

independently. The Los Angeles Refinery has limited ability to process Bakken crude oil and other light sweet crude oils, and no modifications are being proposed in the Tesoro Refinery Integration and Compliance Project that would increase the ability of the Refinery to process Bakken crude oil. Please see Section 2.5.4.1 and the McGovern Report in Appendix F for further explanation of the limitations on the Refinery's ability to process lighter crude oils. Replacing the crude oil tanks will not change the origin of the crude oil because the Refinery is not making any equipment modifications that would allow it to receive crude oils that cannot be blended to the same API gravity and sulfur content parameters than it currently receives. Therefore, there are no direct or indirect impacts on refinery tanks, units, or operations due to operation of the proposed Vancouver Energy Terminal.

4.2 AIR QUALITY

The NOP/IS (see Appendix A) determined the air quality impacts of the proposed project at the Refinery are potentially significant. Project-specific and cumulative adverse air quality impacts associated with increased emissions of air contaminants (criteria air pollutants, GHGs, and TACs) during the construction and operation phases of the proposed project have been evaluated in this EIR. No comments were received on the air quality analysis presented in the NOP/IS that identified other areas of possible impact that would require additional analysis. Potential adverse health impacts to sensitive receptors have also been analyzed in the EIR. Potential construction and operational air quality impacts at the Refinery and the surrounding areas are provided in this section.

While the proposed project is expected to emit GHGs, emitting GHGs by a single project into the atmosphere would not by itself necessarily cause an adverse environmental effect. Rather, it is the increased accumulation of GHGs from more than one project and many other sources that may result in global climate change. The resultant consequences of that climate change can cause adverse environmental effects. In virtually every project subject to CEQA review, a project's GHG emissions will be relatively small, even infinitesimal, within the scope of global or even statewide GHG emissions, and, as such, will almost certainly have no significant direct impact on climate change. The proposed project is expected to reduce GHG emissions, which will aid the State in achieving AB32 goals. However, due to the complex physical, chemical, and atmospheric mechanisms involved in global climate change, it is likely impossible to identify the specific impact, if any, to global climate change from one project's incremental increase in global GHG emissions. As such, the project GHG emissions and the resulting significance of potential impacts are more properly assessed on a cumulative basis. Therefore, the environmental setting and the significance of potential impacts from the proposed project's GHG emissions is determined on a cumulative basis in Chapter 5 - Cumulative Impacts.

4.2.1 SIGNIFICANCE CRITERIA

A threshold of significance is an identifiable quantitative, qualitative, or performance level of a particular environmental effect. Proposed projects that do not exceed the significance threshold for the effect under evaluation normally will be determined to be less than significant. Exceeding the significance thresholds means the effect will normally be determined to be significant by the lead agency (CEQA Guidelines Section 15064(a)).

To determine whether or not air quality impacts from the proposed project are significant, impacts will be evaluated and compared to the significance criteria in Table 4.2-1. If impacts equal or exceed any of the criteria in Table 4.2-1, they will be considered significant.

TABLE 4.2-1

Air Quality Significance Thresholds

Mass Daily Thresholds[a]		
Pollutant	**Construction[b]**	**Operation[c]**
NO_x	100 lb/day	55 lb/day
VOC	75 lb/day	55 lb/day
PM10	150 lb/day	150 lb/day
PM2.5	55 lb/day	55 lb/day
SOx	150 lb/day	150 lb/day
CO	550 lb/day	550 lb/day
Lead	3 lb/day	3 lb/day
Toxic Air Contaminants, Odor, and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Chronic and Acute Hazard Index ≥ 1.0 (project increment) Cancer Burden ≥ 0.5 excess cancer cases (in areas ≥ 1 in 1 million)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000MT/yr CO_2eq for industrial facilities	
Ambient Air Quality for Criteria Pollutants[d]		
NO_2 1-hour average annual average	In attainment; significant if project causes or contributes to an exceedance of any standard: 0.18 ppm (state) and 0.100 (federal)[e] 0.03 ppm (state) and 0.0534 ppm (federal)	
PM10 24-hour annual average	10.4 $\mu g/m^3$ (construction)[f] and 2.5 $\mu g/m^3$ (operation) 1.0 $\mu g/m^3$	
PM2.5 24-hour average	10.4 $\mu g/m^3$ (construction)[f] and 2.5 $\mu g/m^3$ (operation)	
SO_2 1-hour average 24-hour average	0.255 ppm (state) and 0.075 ppm (federal – 99th percentile) 0.04 ppm (state)	
Sulfate 24-hour average	25 $\mu g/m^3$ (state)	
CO 1-hour average 8-hour average	In attainment; significant if project causes or contributes to an exceedance of any standard: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Lead 30-day average Rolling 3-month average Quarterly average	1.5 $\mu g/m^3$ (state) 0.15$\mu g/m^3$ (federal) 1.5$\mu g/m^3$ (federal)	

a) Source: SCAQMD CEQA Handbook (SCAQMD, 1993)
b) Construction thresholds apply to both the SCAB and Coachella Valley (Salton Sea and Mojave Desert Air Basin)
c) For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
d) Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
e) The federal threshold has not been adopted for general use yet by SCAQMD, but as it is a federal requirement for permits being issued for this project.
f) Ambient air quality threshold based on SCAQMD Rule 403.

KEY: ppm = parts per million; $\mu g/m^3$ = microgram per cubic meter; lb/day = pounds per day; MT/yr CO2eq = metric tons per year of CO_2 equivalents, ≥ greater than or equal to, > = greater than

The SCAQMD makes significance determinations for construction impacts based on the maximum or peak daily emissions during the construction period, which provides a "worst-case" analysis of the construction emissions. Similarly, significance determinations for operational emissions are based on the maximum or peak daily emissions during the operational phase. For equipment subject to SCAQMD permit requirements, peak daily emissions are the maximum potential emissions allowed by permit conditions.

4.2.2 ENVIRONMENTAL IMPACTS

4.2.2.1 Construction Emission Impacts

4.2.2.1.1 Regional Impacts

Construction emissions are expected from the following equipment and processes:

- On-site construction equipment (loaders, backhoes, forklifts, etc.);
- On-site and off-site vehicle emissions, including delivery trucks and worker vehicles;
- On-site fugitive dust associated with site construction activities; and,
- On-site and off-site fugitive dust associated with travel on unpaved and paved roads.

Construction emissions were calculated for peak day construction activities in each month construction is expected to occur. Daily construction emissions were calculated for the peak construction day activities and are presented in Table 4.2-2. Peak day emissions are the sum of the highest potential daily emissions from all construction sources, which include employee vehicles, fugitive dust sources, construction equipment, and transport activities for the construction period. Total peak construction emissions for VOC occur in Month 25 when the new storage tanks are painted, while peak daily construction emissions for CO is expected to occur in Month 20 and NOx, SOx, PM10, and PM2.5 occur in Month 18. Detailed construction emissions calculations are provided in Appendix B-1.

Construction Equipment

On-site construction equipment would be a source of combustion emissions. Construction equipment may include backhoes, compressors, compactors, cranes, dozers, excavators, front-end loaders, generators, graders, pile drivers, roll-off trucks, tractors, trenchers, water trucks and welding machines. The equipment is assumed to be operational no more than ten hours per day during a normal construction day. Construction workers are expected to be at the site for longer than ten hours per day, including time for lunch and breaks, organization meetings, and so forth, however, construction equipment would not be expected to operate for more than ten hours. However, some project components (No. 51 Vacuum Unit, Alkylation Unit, Carson Steam Generation, and LHU at the Carson Operations and the HCU at the Wilmington Operations) will experience periods of 24-hour per day turnarounds, when equipment is assumed to be operational up to 20 hours per day. Each turnaround period is expected to be shorter than 30 days and most of the turnaround periods are not expected to overlap. To provide a conservative assumption, it is assumed that turnarounds would occur during peak construction. Construction emission

calculations have accounted for project components with activities during turnaround periods. Emission factors for construction equipment were taken from the CARB OFFROAD Inventory Model (http://www.arb.ca.gov/msei/categories.htm) and the CEQA Air Quality Handbook Construction Equipment Emissions tables available on the SCAQMD webpage (http://aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors), for emission categories not available in CARB's most recent OFFROAD inventory. Estimated emissions from construction equipment used for construction are included in Table 4.2-2 and Appendix B-1.

TABLE 4.2-2

Tesoro Refinery
Unmitigated Peak Construction Emissions[(a)]
(lb/day)

ACTIVITY	VOC	CO	NOx	SOx	PM10	PM2.5[(b)]
Construction Equipment	41.18	422.81	420.92	0.90	29.82	26.23
Vehicle Emissions	3.22	92.73	154.81	0.51	32.57	10.96
Fugitive Dust From Construction[(c)]	--	--	--	--	2.36	0.68
Fugitive Road Dust[(c)]	--	--	--	--	3.80	0.80
Architectural Coating	62.25	--	--	--	--	--
Total Emissions[(d)]	**106.65**	**515.54**	**575.73**	**1.41**	**68.55**	**38.67**
SCAQMD Threshold Level	75	550	100	150	150	55
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**

(a) Peak emissions for VOC predicted to occur in Month 25. Peak CO predicted to occur in Month 20. NOx, SOx, PM10, and PM2.5 predicted to occur during Month 18.
(b) PM2.5 is determined using the methodology in SCAQMD, 2006.
(c) Assumes application of water three times per day.
(d) The emissions in the table may differ slightly from those in Appendix B-1 due to rounding.

Vehicle Emissions

Vehicle emissions include construction worker vehicles, pick-up trucks, flatbed trucks, dump trucks, water trucks, semi tractors, concrete trucks, and delivery trucks. Primary emissions generated would include combustion emissions from engines during idling and while operating. Emissions are based on the estimated number of trips per day and the round trip travel distances.

Construction emissions include emissions from construction worker vehicles traveling to and from the work site. The peak manpower needed during the construction period is expected to vary up to a maximum of 696 workers in Month 20. However, the peak emission calculations were estimated to occur during Months 18 for NOx, SOx, PM10 , and PM2.5, 20 for CO, and 25 for VOC, when the numbers of workers are expected to be 661, 696, and 609, respectively (see Appendix B-1). Each worker commute vehicle is assumed to travel a one-way distance of 14.7 miles (CAPCOA, 2013) to and from work each day, making two one-way trips per day with the average vehicle ridership assumed to be 1.1, i.e., most workers drive alone. Emissions from

employee vehicles are presented in Table 4.2-2 and Appendix B-1. Emissions from employee vehicles were calculated using the EMFAC2011 emission factors available on the CARB Emissions Inventory webpage (http://www.arb.ca.gov/msei/categories.htm).

All cars and pickup trucks used for short trips within and near the Refinery to travel between equipment storage and the Refinery units are assumed to travel five miles or less per trip.

Medium- and heavy-duty diesel trucks include dump trucks, water trucks, and delivery trucks. Heavy heavy-duty semi-trucks and concrete trucks were also included in the project construction analysis. Primary emissions generated would include exhaust emissions from diesel engines while operating. Emissions from trucks (both delivery and heavy-duty) are calculated using the EMFAC2011 on-road emission factors. Estimated emissions for all trucks are included in Vehicle Emissions in Table 4.2-2 and Appendix B-1.

Fugitive Dust Associated with Site Construction Activities

Fugitive dust sources include grading, trenching, wind erosion, and truck filling/dumping at the site to construct necessary foundations. During construction activities, water would be applied as a dust suppressant in the construction area during grading, trenching, and earth-moving activities to control or reduce fugitive dust emissions pursuant to SCAQMD Rule 403. Application of water reduces PM emissions by a factor of up to 61 percent (SCAQMD, 2007). Fugitive dust suppression, often using water, is a standard operating practice and is one method of complying with SCAQMD Rule 403. Estimated peak controlled PM10 and PM2.5 emissions during peak construction activities for fugitive dust sources are 2.36 pounds per day (lb/day) and 0.68 lb/day, respectively (see Table 4.2-2). The detailed emission calculations are provided in Appendix B-1.

Fugitive Dust Associated with Travel on Paved and Unpaved Roads

Vehicles and trucks traveling on paved and unpaved roads are also a source of fugitive emissions during the construction period. Fugitive dust emissions were also calculated for on-site cars, light-duty trucks, and buses. The fugitive emissions for trucks assume delivery trucks would travel on paved roads and water trucks and off-road construction equipment would travel on unpaved roads. Emissions of dust caused by travel on paved roads were calculated using the U.S. EPA's, AP-42, Section 13.2.1 emission factor for travel on paved roads. Emissions of dust caused by travel on unpaved roads were calculated using the U.S. EPA's, AP-42, Section 13.2.2 emission factor for travel on unpaved roads. CARB's Methodology 7.9 was used to determine the appropriate silt loading for calculating fugitive dust emissions. The estimated PM10 and PM2.5 emissions during peak construction activities (Month 18) from vehicles for fugitive dust on paved roads are 26.03 lb/day and 10.96 lb/day, respectively (see Table 4.2-2 and Appendix B-1). The estimated PM10 and PM2.5 emissions during peak construction activities (Month 18) from vehicles for fugitive dust on unpaved roads are 3.80 lb/day and 0.80 lb/day, respectively (see Table 4.2-2 and Appendix B-1).

Architectural Coatings

The proposed project would include applying some architectural coating to equipment as necessary. Refinery equipment is often painted with specific types of architectural coatings to provide protection from extreme environmental conditions. Most of the parts are expected to be delivered pre-painted, however, some touch up to the project components is expected once they are installed. The new crude tanks will be coated on-site; therefore, most of the architectural coating will occur later in the construction schedule. The proposed project would use SCAQMD Rule 1113 compliant coatings, which limits the VOC emissions of the coating to 100 grams per liter (0.83 pounds per gallon). The estimated architectural VOC emissions during peak construction activities (Month 25) is 62.25 lb/day (see Table 4.2-2 and Appendix B-1).

Miscellaneous Emissions

Pre-project soil sampling and analysis have identified that hydrocarbons may be encountered during construction activities. Therefore, in addition to the construction-related emissions already identified, the proposed project could generate emissions of VOC if contaminated soil is found and soil remediation activities are necessary. Since the proposed project site has been identified as having soil containing VOC materials, excavation at this site is subject to the requirements of SCAQMD Rule 1166. The facility must obtain a SCAQMD-approved Rule 1166 Mitigation Plan to assure the control of fugitive emissions prior to the start of excavation activities. Rule 1166 includes requirements for SCAQMD notification at least 24 hours prior to the start of excavation, monitoring (at least once every 15 minutes, within three inches of the excavated soil surface), as well as implementation of a mitigation plan when VOC-contaminated soil is detected. Rule 1166 defines VOC contaminated soil as soil which registers a concentration of 50 ppmv or greater of VOC. An approved mitigation plan generally includes covering contaminated soil piles with heavy plastic sheeting and watering activities to assure the soil remains moist. In addition, VOC-contaminated soils shall be treated or removed within 30 days from the time of excavation. Soil remediation activities are also under the jurisdiction of the RWQCB. Following SCAQMD approval of the proposed project, a Soil Management Plan will be submitted to the RWQCB for approval. The RWQCB, when considering the Soil Management Plan, relies on the analysis in this EIR and the SCAQMD Rule 1166 Mitigation Plan. The quantification of VOC emissions from soil contamination is estimated to be a maximum of approximately 18 pounds per day (see Appendix B-1 for detailed calculations). VOC emissions from soil excavation activities are not shown in Table 4.2-2 because they are expected to occur during excavation activities, which happen in the early months of construction, and are not expected to occur when the peak VOC emissions occur, which is during painting of new storage tanks that occurs towards the end of construction.

Construction Emission Summary

Construction activities associated with the modifications to the Refinery would result in emissions of CO, VOC, NOx, SOx, PM10, and PM2.5. Construction emissions for the proposed project are summarized in Table 4.2-2, together with the SCAQMD's daily construction significance threshold levels. The construction phase of the proposed project will exceed the

significance threshold for VOC and NOx. Therefore, unmitigated air quality impacts associated with construction are considered significant. Required mitigation is discussed in Section 4.2.3.

4.2.2.1.2 Localized Construction Air Quality Impacts

The SCAQMD has developed Localized Significance Threshold (LST) Methodology to evaluate the potential localized impacts of criteria pollutants from construction activities (SCAQMD, 2008). The LST Methodology requires that the emissions of CO, NO_2, PM10, and PM2.5 associated with a proposed project be evaluated for impacts on ambient air quality standards at local receptors. Impacts from other criteria pollutants are regional in nature or in attainment and, therefore, are not included as part of the localized air quality analysis. Furthermore, only on-site construction emissions sources are required to be included in the LST analysis. In typical construction projects involving multiple areas, heavy equipment such as cranes are shared and moved from area to area as necessary. However, the LST construction emissions analysis assumes that no project component would be sharing equipment, thus, providing a conservative estimate of the localized impacts of each project component during the peak months. The peak on-site construction emissions occur in Month 20 and were used for analyzing the localized impacts.

In order to determine the ground-level pollutant concentrations, the U.S. EPA AERMOD air dispersion model was used to model the peak day construction emissions (see Table 4.2-3) and calculate the annual average and maximum 1-hour, 8-hour, and 24-hour concentrations, as specified, for each pollutant. All active construction areas during the peak construction months were modeled as individual area sources geographically located at each unit.

TABLE 4.2-3

Localized Construction Air Quality Impact Analysis Results

Criteria Pollutant	Averaging Period	Modeled GLC ($\mu g/m^3$)	Background GLC ($\mu g/m^3$)[(a)]	Total GLC ($\mu g/m^3$)	Most Stringent Air Quality Standard ($\mu g/m^3$) [(b)]	Exceeds LST Threshold?
CO	1-hour	291.38	7,929.8	8,221.1	23,000	No
	8-hour	58.46	4,908.9	4,967.4	10,000	No
NO_2[(c)]	1-hour	200.43	255.5	455.9	339	Yes
	1-hour (Federal)	156.51[(d)]	146.30[(e)]	302.8	188	Yes
	Annual	4.99	47.7	52.7	57	No
PM10	24-hour	3.46	--	--	10.4	No
	Annual	0.86	--	--	1	No
PM2.5	24-hour	3.46	--	--	10.4	No
	Annual	0.86	--	--	1	No

GLC = ground-level concentration
(a) South Coastal LA County years 2011-2014 Station 033 and 072.
(b) SCAQMD CEQA thresholds. For PM10 and PM2.5, project comparison to incremental change.
(c) Impacts from air dispersion model are reported as using ambient ratio method.
(d) The federal 1-hour NO_2 standard is the 3-year average of the 98th percentile. The modeled GLC used highest 98th percentile per year.
(e) 98th percentile background NO_2 value from the SCAQMD.

CO is in attainment; however, CO was included in the analysis for completeness. NO_2 emissions were estimated using the U.S. EPA recommended ambient ratio method (ARM), which converts NOx to NO_2 based on a fixed ratio (U.S. EPA, 2014). PM 2.5 was taken as equivalent to PM10 to present a conservative analysis. The details of the assumptions used in the modeling are provided in Appendix B-2.

To determine the significance of construction PM10 and PM2.5 emissions, proposed project emissions are compared to an incremental change in ambient air quality significance threshold (i.e., the SCAQMD established acceptable incremental increase significance thresholds for pollutants where the background concentration is greater than the most stringent ambient air quality standard). Once calculated, the PM10 and PM2.5 ground-level concentrations are directly compared to the appropriate incremental change in ambient air quality significance thresholds. Significance for localized PM10 and PM2.5 emissions is evaluated differently than CO or NO_2 because PM10 and PM2.5 already exceed the most stringent state or federal PM10 and PM2.5 ambient air quality standards in nearly all areas in the Basin. For the CO 1-hour, CO 8-hour, NO_2 1-hour, and NO_2 annual average significance determinations, ground-level concentrations from the proposed project are calculated, added to the background ambient concentrations and compared to the most stringent ambient air quality standard. If the result exceeds the most stringent ambient air quality standard for that pollutant, the localized impact is concluded to be significant. Because the SCAQMD's area of jurisdiction exceeds at least one ambient air quality standard for PM10 and PM2.5, it is classified as nonattainment for these criteria pollutants. As a result, PM10 and PM2.5 localized air quality impacts are compared to significance thresholds developed specifically for these two pollutants (SCAQMD, 2008). The localized air quality analysis results and significance conclusions are shown in Table 4.2-3 (see Appendix B-2 for more detailed calculations).

The LST analysis results indicate that NO_2 emissions at residential receptors are expected to exceed the significance thresholds in Table 4.2-3 from construction activities associated with the proposed project. The maximum ground-level concentrations for a residential receptor are expected to occur approximately 1,350 feet west of the Wilmington Operations. Therefore, the localized air quality impacts from the proposed project would be considered significant during construction. Required mitigation is discussed in Section 4.2.3.

4.2.2.2 Operational Emission Impacts

The proposed project's operational emissions are evaluated in this subsection. Direct daily operational emissions include stationary and mobile source emissions that are expected from the proposed project. Stationary sources include combustion sources, storage tanks, and fugitive sources. Mobile sources include trucks, trains, and marine vessels. Since the proposed project does not involve adding new employees, no new passenger vehicle trips are included in the analysis. Detailed operational emission calculations are provided in Appendix B-3. In addition to new or modified emission sources, the proposed project includes emission reductions resulting from the shutdown of one of the Refinery's two FCCUs, the Wilmington Operations FCCU, which is currently a major source of emissions. Peak daily emissions are expected to decrease for CO. However, peak daily emissions are expected to increase for VOC, NOx, SOx, PM10,

and PM2.5. Table 4.2-4 summarizes the expected daily operational emissions for the proposed project.

Due to the complexity and duration of the Refinery integration, some project components are expected to be implemented prior to the shutdown of the Wilmington Operations FCCU (referred to as the Interim Operations Scenario). To assess the interim impact of the proposed project, the project components that will be operational in advance of the shutdown of the Wilmington Operations FCCU have been evaluated. Project components included in the Interim Operations Scenario include the Wilmington Operations DCU H-100 Heater Duty Bump, and fugitive emissions from the Wilmington Operations HCU and Carson HCU Mods, LHU Mods, and Mid Barrel Distillate Treater. Table 4.2-5 presents the operational emissions that are expected from the Interim Operations Scenario. The expected interim emissions are less than significant.

An additional transitional period is expected to occur to facilitate the integration of the Refinery and the shutdown of the Wilmington Operations FCCU. The transitional period is expected to be approximately 90 days prior to the Wilmington Operations FCCU shutdown, when Refinery units will become operational while the Wilmington Operations FCCU remains operating. The transitional period is expected to create a temporary increase in emissions that when combined with the concurrent ongoing construction of other portions of the proposed project will have significant air quality impacts (see Table 4.2-6). The 90-day transitional period results in significant VOC and NOx emission impacts that are less than the significant peak daily VOC, and NOx emissions from construction alone. Additionally, the 90-day transitional period results in less than significant CO emission impacts that are less than the peak daily CO emissions. However, the 90-day transitional period results in less than significant SOx, PM10 and PM2.5 emission impacts that are greater than the peak daily SOx, PM10, and PM2.5 emissions from construction alone. The transitional period operational emissions increase will cease and become the reduced emissions presented in Table 4.2-4 following the shutdown of the Wilmington Operations FCCU and completion of the proposed project.

TABLE 4.2-4
Tesoro Los Angeles Refinery
Proposed Project Operational Emissions Summary

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[a]
Direct Emission Impacts from Stationary Sources						
Wilmington DCU H-100 Heater Duty Bump[b]	-0.43	-5.14	-171.03	86.69	-0.98	-0.98
Wilmington HCU H-300/301 Heater Duty Bump[c]	10.10	49.75	4.67	-14.98	10.79	10.79
SARP Process Air Heater	3.27	16.37	6.99	0.28	3.51	3.51
SARP Decomp. Furnace	6.88	34.39	2.45	0.59	7.37	7.37
SARP Converter Heater	0.82	4.09	1.75	0.07	0.88	0.88
SARP Process Vent	--	--	--	31.12	--	--
Wilmington Tanks	141.64	--	--	--	--	--
Wilmington Fugitive Emissions:						
CRU 3	10.24	--	--	--	--	--
Crude Tanks	3.61	--	--	--	--	--
HCU	20.69	--	--	--	--	--
HTU 1	3.50	--	--	--	--	--
HTU 2	3.80	--	--	--	--	--
HTU 4	6.32	--	--	--	--	--
Interconnect Piping	37.20					
PSTU	15.44	--	--	--	--	--
Sulfuric Acid Plant[d]	--	--	--	--	--	--
Wilmington FCCU Shutdown:[e]						
Wilmington FCCU and CO Boiler	-290.46	-909.62	-343.31	-387.50	-121.30	-121.30
Wilmington Heaters H2, H3/H4, and H5	-10.74	-49.36	-226.28	-28.87	-49.88	-49.88
Wilmington Startup Heater	-0.16	-0.81	-3.00	-0.01	-0.17	-0.17
Wilmington Fugitive Components	-17.60	--	--	--	--	--
Carson No. 51 Vacuum Unit Heater	32.85	233.85	32.72	1.80	45.49	45.49
Carson Naphtha HDS ULNB Conversion	1.73	10.23	1.87	0.64	5.56	5.56
Carson Crude Tanks	112.51	--	--	--	--	--
Carson Fugitive Emissions:						
No. 51 Vacuum Unit	11.74	--	--	--	--	--
Alkylation	18.88	--	--	--	--	--
Crude Tanks	43.05	--	--	--	--	--
Carson HCU Mods	6.77	--	--	--	--	--
Interconnect Piping	27.22	--	--	--	--	--
Carson LHU Mods	14.34	--	--	--	--	--
Carson LPG Railcar Unload	26.85	--	--	--	--	--
Carson Mid Barrel Distillate Treater	2.15	--	--	--	--	--
Carson Naphtha Isomerization Unit	9.46	--	--	--	--	--
Carson NHDS Mods	15.21	--	--	--	--	--
Carson Wet Jet Treater	50.45	--	--	--	--	--
Subtotal, Direct Stationary Source Emissions	**317.33**	**-616.25**	**-693.17**	**-310.17**	**-98.73**	**-98.73**

TABLE 4.2-4 (continued)

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[a]
Indirect Emission Impacts from Stationary Sources						
Wilmington DCU Heater H-101	0.83	4.36	19.00	7.58	0.83	0.83
Wilmington HTU #3 Heaters H-30 and H-21/22	2.20	3.14	20.56	3.86	2.56	2.56
Wilmington CRU Heaters H-501A/B, H-502, H-503/504, and H-510	0.23	1.55	1.75	0.65	0.74	0.74
Wilmington Boilers 7, 8, 9, and 10	1.26	0.74	24.00	6.14	3.78	3.78
Wilmington SRP Boilers H-1601/1602	0.02	0.01	0.11	0.04	0.05	0.05
Wilmington SRP Incinerators F-704 and F-754	0.02	0.08	0.76	25.32	0.04	0.04
Wilmington Existing Tanks 80044, 80074, 80211, 80215, and 80217	4.12	--	--	--	--	--
Carson FCCU[f]	--	--	--	--	--	--
Carson HC Heater R-1	1.77	1.04	18.00	4.61	5.38	5.38
Carson HC Heater R-2	2.36	1.38	14.40	9.81	7.18	7.18
Carson LHU Heater	0.62	0.36	6.00	1.50	1.87	1.87
Carson Existing Tanks 14, 31, 62, 63, 64, 502, and 959	64.35	--	--	--	--	--
Watson Cogen Facility	4.15	4.50	20.60	2.50	9.85	9.85
Subtotal, Indirect Stationary Source Emissions	**81.93**	**17.16**	**125.18**	**62.01**	**32.28**	**32.28**
Mobile Sources[g][h]						
Vehicle Emissions	0.03	0.20	0.73	<0.01	0.21	0.05
Rail Emissions – On-Site Maneuvering	0.66	2.01	11.65	<0.01	0.25	0.24
Rail Emissions – In Basin Transiting	1.20	7.60	25.80	<0.01	0.70	0.60
Subtotal, Mobile Source Emissions	**1.89**	**9.81**	**38.18**	**<0.01**	**1.16**	**0.89**
Total Project Emissions	**401.15**	**-589.28**	**-529.81**	**-248.15**	**-65.29**	**-65.56**
Required Regulation XIII Compliance[i]	**-317.33**	--	--	--	--	--
Prior Regulation XIII Compliance[j]	**-34.73**	--	--	--	**-9.85**	**-9.85**
Expected ERCs[k]	--	--	--	--	**76.30**	**76.30**
Expected RTCs to be Retained[l]	--	--	**491.63**	**248.14**	--	--
Total Project Emissions after Regulation XIII Compliance and ERC Generation[m]	**49.09**	**-589.28**	**38.18**	**<0.01**	**1.16**	**0.89**
Significance Threshold	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Negative numbers represent emission reductions.

(a) PM10 emissions are assumed to be 100 percent PM2.5 emissions for stationary combustion sources.
(b) Negative numbers represent emission reductions as a result of permit limits imposed, which will reduce emissions to less than historically achieved.
(c) SOx emissions reduction expected due to fuel switch from refinery fuel gas to natural gas, which contains less sulfur.
(d) No fugitive VOC emissions are expected from the Sulfuric Acid Plant.
(e) Based on actual historical emissions.
(f) Peak daily emissions are not expected to change, but increased utilization will affect annual emissions.
(g) Peak day marine vessel emissions do not change as a result of the proposed project.
(h) On-road mobile source emissions represent vehicle trips only within the jurisdiction of the SCAQMD. On-road mobile source emissions projected to occur outside of the SCAQMD's area of jurisdiction are provided in Subsection 4.2.2.2.2.

TABLE 4.2-4 (concluded)

(i) Regulation XIII compliance requires offsetting the project direct stationary source emissions increases. Indirect stationary source emissions increases comply with Regulation XIII – New Source Review.
(j) Some indirect sources (i.e., Carson Tanks 14, 502, and 959, Wilmington H-101, and Carson R-2) have undergone prior new source review.
(k) ERCs for emission reductions are expected to be generated for PM10. No credits are issued for PM2.5 because it is a constituent of PM10.
(l) Local emission reductions of SOx and NOx will result from the project. Tesoro will retain RTCs from retiring the Wilmington Operations FCCU for operation of its Los Angeles Refinery.
(m) Regulation XIII compliance applied to significance determination reduces the VOC emissions to zero from stationary sources and ERCs are expected from emission reductions of PM10, so that the proposed project shows an emissions increase from mobile sources only.

As shown in Table 4.2-4, there are substantial emission reductions in CO from the proposed project. NO, SOx, PM10, and PM2.5 will have local emissions benefits, but will be regionally neutral as RTCs and Emission Reduction Credits (ERCs) will be retained or generated. VOC emission increases from direct stationary sources associated with the proposed project will be offset using concurrent emission reductions or as required by SCAQMD Regulation XIII for emission increases greater than one pound per day from newly permitted and modified existing permitted emission sources. Use of emission offsets will reduce potential air quality impacts associated with emission increases from stationary sources, including fugitive emissions. Equipment that will use concurrent emission reductions will be restricted by SCAQMD permit conditions to ensure the Wilmington Operations FCCU is shutdown to provide the necessary offsets. The draft Title V permit condition for the Carson Operations is expected to be as follows:

L341.XX Within 90 days after startup of this equipment the following devices shall be removed from operation:
(D96) FCCU Regenerator at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D112) CO Boiler at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D92) H-2 Steam Superheater at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D89) H-3 Fresh Feed Heater at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D90) H-4 Hot Oil Loop Reboiler at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D91) H-5 Fresh Feed Heater at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D1664) B-1 Startup Heater at Tesoro LAR Wilmington Operations (Facility ID: 800436)

A similar condition will be included in the Wilmington Operations permit. For equipment that will use ERCs to comply with Regulation XIII, ERCs will be provided prior to startup. Additionally, although the project is expected to result in PM10 and PM2.5 emission reductions, these benefits have been removed from the summary in Table 4.2-4 because Tesoro will seek ERCs for the PM10. The availability of PM10 ERCs is dwindling and ERCs may be needed for future projects at the Los Angeles Refinery or elsewhere in the South Coast Air Basin.

TABLE 4.2-5

Tesoro Los Angeles Refinery
Proposed Project Interim Operational Emissions Summary

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[a]
Direct Emission Impacts from Stationary Sources						
Wilmington DCU H-100 Heater Duty Bump[b]	-0.43	-5.14	-171.03	86.69	-0.98	-0.98
Wilmington Fugitive Emissions:						
HCU	20.69	--	--	--	--	--
Carson Fugitive Emissions:						
Carson HCU Mods	6.77	--	--	--	--	--
Carson LHU Mods	14.34	--	--	--	--	--
Carson Mid Barrel Distillate Treater	2.15	--	--	--	--	--
Subtotal, Direct Stationary Source Emissions	**43.52**	**-5.14**	**-171.03**	**86.69**	**-0.98**	**-0.98**
Indirect Emission Impacts from Stationary Sources						
Wilmington DCU Heater H-101	0.83	4.36	19.00	7.58	0.83	0.83
Wilmington HTU #3 Heaters H-30 and H-21/22	2.20	3.14	20.56	3.86	2.56	2.56
Wilmington CRU Heaters H-501A/B, H-502, H-503/504, and H-510	0.23	1.55	1.75	0.65	0.74	0.74
Wilmington Boilers 7, 8, 9, and 10	1.26	0.74	24.00	6.14	3.78	3.78
Wilmington SRP Boilers H-1601/1602	0.02	0.01	0.11	0.04	0.05	0.05
Wilmington SRP Incinerators F-704 and F-754	0.02	0.08	0.76	25.32	0.04	0.04
Wilmington Existing Tanks 80044, 80074, 80211, 80215, and 80217	4.12	--	--	--	--	--
Carson LHU Heater	0.62	0.36	6.00	1.50	1.87	1.87
Subtotal, Indirect Stationary Source Emissions	**9.30**	**10.24**	**72.18**	**45.09**	**9.87**	**9.87**
Total Project Emissions	**52.82**	**5.10**	**-98.85**	**131.78**	**8.89**	**8.89**
Required Regulation XIII Compliance[c]	**-43.52**	**--**	**--**	**--**	**--**	**--**
Prior Regulation XIII Compliance[d]	**-0.83**	**--**	**--**	**--**	**--**	**--**
Total Project Emissions after Regulation XIII Compliance	**8.47**	**5.10**	**-98.85**	**131.78**	**8.89**	**8.89**
Significance Threshold	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Negative numbers represent emission reductions.

(a) PM10 emissions are assumed to be 100 percent PM2.5 emissions for stationary combustion sources.

(b) Negative numbers represent emission reductions as a result of permit limits imposed, which will reduce emissions to less than historically achieved.

(c) Regulation XIII compliance requires offsetting the project direct stationary source emissions increases. Indirect stationary source emissions increases comply with Regulation XIII – New Source Review.

(d) Indirect source Wilmington H-101has undergone prior new source review.

TABLE 4.2-6

Tesoro Los Angeles Refinery
Proposed Project Construction and 90-Day Transitional Period
Operational Emissions Summary

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[a]
CONSTRUCTION EMISSIONS						
Maximum Construction Emissions during Transitional Period[b]	**52.38**	**488.48**	**575.73**	**1.41**	**68.55**	**38.67**
TRANSITIONAL PERIOD OPERATIONAL EMISSIONS						
Emissions from Interim Operations[c]	**8.47**	**5.10**	**-98.85**	**131.78**	**8.89**	**8.89**
Direct Emission Impacts from Stationary Sources[d]						
Wilmington Fugitive Emissions:						
Interconnect Piping[e]	13.02	--	--	--	--	--
Carson Fugitive Emissions:						
Interconnect Piping[e]	9.53	--	--	--	--	--
Carson LPG Railcar Unload	26.85	--	--	--	--	--
Carson NHDS Mods	15.21	--	--	--	--	--
Subtotal, Direct Stationary Source Emissions	**64.61**	**--**	**--**	**--**	**--**	**--**
Indirect Emission Impacts from Stationary Sources						
Carson Existing Tanks 31 ,62 63, and 64	36.92	--	--	--	--	--
Subtotal, Indirect Stationary Source Emissions	**36.92**	**--**	**--**	**--**	**--**	**--**
Mobile Sources						
Rail Emissions – On-Site Maneuvering	0.66	2.01	11.65	<0.01	0.25	0.24
Rail Emissions – In Basin Transiting	1.20	7.60	25.80	<0.01	0.70	0.60
Subtotal, Mobile Source Emissions	**1.86**	**9.61**	**37.45**	**<0.01**	**0.95**	**0.84**
Total Construction and Transitional Period Project Emissions	**164.24**	**503.19**	**514.33**	**133.19**	**78.39**	**48.40**
Required Regulation XIII Compliance[f]	**-64.61**	**--**	**--**	**--**	**--**	**--**
Total Project Emissions after Regulation XIII Compliance	**99.63**	**503.19**	**514.83**	**133.19**	**79.39**	**48.40**
Significance Threshold	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**

(a) PM10 emissions are assumed to be 100 percent PM2.5 emissions for stationary combustion sources.
(b) The projected peak construction emissions during the transitional period are expected to occur in Month 18 (See Appendix B-1 Construction Emission Summary).
(c) From Table 4.2-5.
(d) The unmitigated construction emissions combined with the transitional period of operational emissions are expected to occur for the 90 days prior to the Wilmington Operations FCCU shutdown. At which time, emission reductions will occur (see Table 4.2-4).
(e) The emissions associated with the interconnecting piping have been reduced to reflect that prior to the shutdown of the Wilmington Operations FCCU only two pipes will be operational.
(f) Regulation XIII compliance requires offsetting the project direct stationary source emissions increases. Indirect stationary source emissions increases comply with Regulation XIII – New Source Review.

As discussed in Section 4.1.1, indirect impacts from equipment potentially impacted by the proposed project, but not part of the proposed project (i.e., upstream or downstream equipment that are not modified as part of the proposed project) were evaluated to determine if they contributed to an emissions increase, even though the equipment is operating within permit limits and no permit modification would be required. These indirect effects were analyzed and are included in the emissions impact of the proposed project (see Table 4.2-4). The overall change in emissions associated with implementing the proposed project is shown in Table 4.2-4 and detailed operational emission calculations are provided in Appendix B-3. The proposed project is expected to generate emission reductions of CO, which is considered an emissions benefit, and a less than significant increase in VOC, NOx, SOx, PM10, and PM2.5 emissions.

To assess the potential impacts of the proposed project on modified equipment, the proposed permitted firing rates were used to determine the potential maximum emissions from the proposed project during operation and compared to actual emission in the baseline years of 2012 and 2013. The baseline emissions are based on the actual achieved emissions less two percent of the maximum (also called the 98th percentile) emissions reported under the SCAQMD RECLAIM and Annual Emissions Reporting programs for all affected combustion sources. The use of the 98th percentile normalizes the achieved maximum from the peak value, to avoid any anomaly. The 98th percentile is based on the US EPA's Primary National Ambient Air Quality Standards (NAAQS) for Nitrogen Dioxide (February 9, 2010) that established the 1-hour standard for NO_2 based on the 98th percentile of the yearly emissions (see Federal Register http://www.epa.gov/ttn/naaqs/standards/nox/fr /20100209.pdf). Since NOx is one of the primary pollutants emitted at refineries, there is substantial evidence to support the use of the 98th percentile of emissions data in determining the daily actual baseline emissions. The heaters are natural gas-fired and the emissions for criteria pollutants, except NOx, have been calculated using SCAQMD Annual Emission Reporting default factors. NOx emission factors are based on manufacturer's performance guarantees, which are based on manufacturing testing. TAC emissions have been calculated using industry data or refinery-specific test data for similar units (see the discussion in Subsection 4.2.2.5). Detailed operational emission calculations are presented in Appendix B-3.

4.2.2.2.1 Stationary Sources

Combustion Sources

The proposed project contains new combustion sources, modifications to existing combustion sources, and shutdown of combustion sources in the FCCU at the Wilmington Operations. The proposed changes to SCAQMD permit conditions for existing combustion sources are presented in Table 4.2-7.

TABLE 4.2-7

Existing Combustion Sources Modified as Part of the Proposed Project

Source	New/ Modified (N/M)	Current Permitted Firing Rate (mmBtu/hr)	Proposed Permitted Firing Rate (mmBtu/hr)	Change (mmBtu/hr)
Wilmington FCCU Shutdown				
CO Boiler		300.0	0.0	-300.0
H-2		37.4	0.0	-37.4
H-3		94.7	0.0	-94.7
H-4		127.2	0.0	-127.2
H-5		44.0	0.0	-44.0
B-1 Startup Heater		84.0	0.0	-84.0
Wilmington HCU	M	71.1	96.1	25.0
Wilmington DCU	M	252.0	302.4	50.4
SARP	N		67.0	67.0
Carson NHDS[(a)]	M	12.5	12.5	0.0
Carson No. 51 Vacuum Unit	M	300.0	360.0	60.0
Total		**1,310.4**	**831.5**	**-478.9**

Note: Currently permitted firing rates are provided for information purposes only. Emissions analysis compared with actual baseline emissions, a more conservative analysis.

(a) Modification to install ultra-low NOx burner with no change in firing rate.

Storage Tanks

The proposed project includes six new crude storage tanks at the Carson Crude Terminal and two at Wilmington. The emissions associated with the operation of the new storage tanks were calculated using the U.S. EPA TANKS 4.0.9d Model and the associated User's Guide (U.S. EPA, 1999). Emissions increases associated with additional utilization of existing storage tanks were also calculated using the U.S. EPA TANKS 4.0.9d Model and the associated User's Guide with the increased throughput used to determine the incremental increase in emissions.

Fugitive Component Emissions

Fugitive emissions are emissions into the atmosphere that are not directly emitted from permitted equipment through a stack, chimney, vent, or other functionally-equivalent opening. Fugitive emission sources that are part of the proposed project include flanges on pipes and equipment, pumps, valves, compressors, and gauges, which are referred to as fugitive components. Emissions from fugitive components are calculated using emission factors that account for component type and service type (i.e., the material being handled is a vapor, light liquid, or heavy liquid) based on Method 2 of the *SCAQMD Guide for Fugitive Emissions Calculations* (SCAQMD, 2003). The fugitive VOC emissions from the proposed project are summarized in Table 4.2-4 (see also Appendix B-3 for more detailed emission calculations).

All new and modified process components are required to conform to the SCAQMD's BACT Guidelines. Fugitive components or emission sources are also regulated under New Source Performance Standards (NSPS) Subpart GGG and SCAQMD Rule 1173. The BACT associated with each of the major project fugitive components is discussed in the following paragraphs.

Process Pumps: Seal-less pumps will be used in compliance with BACT requirements for pumps in light hydrocarbon service. For those instances where seal-less pumps are not appropriate, SCAQMD BACT Guidelines allow either double or tandem mechanical seals to be used. Tandem mechanical seals that use a barrier fluid and a seal pot vented to a closed system, and dry-running tandem mechanical seals vented to a closed system are considered to be equivalent control technologies since they provide equivalent control of fugitive VOC emissions. All pumps will be subject to an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1173.

Process Valves: Bellow sealed valves will be installed on project fugitive components to reduce fugitive VOC emissions. The SCAQMD BACT/Lowest Achievable Emission Rate (LAER) Guidelines indicate that leak-less valves must be used, except for certain exempt applications.

For heavy hydrocarbon liquids and for applications where leak-less valves cannot be used, SCAQMD BACT Guidance allows the use of valves of standard API/ANSI design to be used. Fugitive VOC emissions from light liquid valves will be monitored and controlled in accordance with an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1173.

Process Drains: New process drain lines will be provided with two normally closed block valves in series or a single block valve in series with a cap or plug as required under SCAQMD Rule 1173. New drain hubs (funnels) will be equipped with P-Traps and/or seal pots along with an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1176.

Flanges: The use of flanged connections will be minimized to the extent practicable. Where required for maintenance or other operations, flanged connections will be designed in accordance with ANSI B16.5-1988, Pipe Flanges and Flanged Fittings. Fugitive emissions will be monitored and controlled in accordance with an approved inspection and maintenance program, as required under SCAQMD Rule 1173.

Pressure Relief Devices (PRDs): PRDs will be routed to the existing Refinery safety flare system, where required, to control VOC emissions in the event of upset conditions in accordance with SCAQMD Rule 1118.

4.2.2.2.2 Mobile Sources

Vehicle Emissions

The operation of the proposed project will involve the following changes to on-road vehicle traffic associated with the Refinery, within and outside of the SCAQMD's area of jurisdiction:

- There will be no increase in workers as compared to baseline conditions following completion of the construction phase because no new workers will be hired for operation of the proposed project.

- Eight trucks per day will transport spent sulfuric acid from the Carson Operations to the new SARP at Wilmington, while the six trucks per day that currently transport spent sulfuric acid from the Wilmington plant to a regeneration facility in Carson will be discontinued. While the number of trucks that will transport spent sulfuric acid will increase by two per day, the distance traveled per truck will be shortened. The net effect is that total vehicle mileage for the transportation of spent sulfuric acid will be reduced.

- Three trucks per day will transport spent caustic to the transfer facility adjacent to the Carson Operations.

- Three trucks per day will transport fresh caustic from a local supplier.

- One truck per day will transport other materials and supplies to or from the Refinery.

The emissions associated with truck traffic are calculated using EMFAC 2011 emission factors for T7 vehicles (heavy, heavy-duty trucks) (see Appendix B-5 for detailed emission calculations). On-road vehicle emissions from the proposed project that contribute to air quality impacts within the SCAQMD's area of jurisdiction are summarized and total project emissions are compared to the SCAQMD's air quality significance thresholds in Table 4.2-4.

Rail Locomotive Emissions

The proposed project includes the following increases in deliveries to and shipments from the Refinery by rail:

- Ten railcars per day of LPG will be delivered from various locations, which could arrive by three different routes depending on the provider.

- Four railcars per week of spent caustic will be shipped to the Gulf Coast for recycling.

It is expected that the additional railcars will be added to existing trains arriving at the Refinery. The rail emissions were calculated using the additional weight of the railcars for on-site maneuvering, transiting within the SCAQMD's area of jurisdiction, and transiting within California, but outside the SCAQMD's area of jurisdiction. The rail locomotive emissions from

the proposed project within the South Coast Air Basin are summarized in Table 4.2-4 (see also Appendix B-5 for more detailed emission calculations).

The sourcing of LPG varies depending on market availability; therefore, the exact routing for deliveries may vary. Routes for the three most likely LPG sources, which include: (1) from Martinez, California (2) from the Nevada state line; and (3) from the Arizona state line, were analyzed. To determine the maximum potential impact of increased rail activity, each route was evaluated using the entire estimated rail activity. Rail emissions for transiting the lines were calculated in appropriate air districts to determine if the proposed project would have significant impacts elsewhere in California. Table 4.2-8 presents the potential emissions that could occur in the various air districts. The emissions are considered less than significant when compared to the CEQA thresholds that have been developed for each of the air districts (see Table 4.2-8).

TABLE 4.2-8

Rail Emissions Outside the SCAQMD's Area of Jurisdiction

Air District[(a)]	Emissions											
	VOC		CO		NOx		SOx		PM10		PM2.5	
	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr
BAAQMD	0.47	0.08	2.95	0.054	10.01	1.83	0.01	0.00	0.26	0.05	0.24	0.04
BAAQMD's CEQA Significance Threshold	54	10	--[(b)]	--	54	10			82	15	54	10
SJVAPCD	1.78	0.32	11.27	2.06	38.20	6.97	0.03	0.01	1.01	0.18	0.93	0.17
SJVAPCD's CEQA Significance Threshold	--	10	--	100	--	10			--	15	--	15
EKAPCD	0.49	0.09	3.12	0.57	10.56	1.93	0.01	0.00	0.28	0.05	0.26	0.05
EKAPCD's CEQA Significance Threshold	--	25	--	--	--	25			--	15	--	--
MDAQMD	0.82	0.15	5.21	0.95	17.65	3.22	0.01	0.00	0.47	0.08	0.43	0.08
MDAQMD's CEQA Significance Threshold	137	25	548	100	137	25			82	15	82	15
ICAPCD	0.62	0.11	3.92	0.72	13.3	2.43	0.01	0.00	0.35	0.06	0.32	0.06
ICAPCD's CEQA Significance Threshold	55	--	550	--	55	--	150	--	150	--	--	--
Significant?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

(a) BAAQMD = Bay Area Air Quality Management District; SJVAPCD = San Joaquin Valley Air Pollution Control District; EKAPCD = Eastern Kern Air Pollution Control District; MDAQMD = Mojave Desert Air Quality Management District; ICAPCD = Imperial County Air Pollution Control District; -- = No threshold established.

(b) – means that the air district has not developed significance thresholds for that pollutant.

Marine Vessel Emissions

Crude oil is received by pipeline to the Refinery from the marine terminals and other locations served by pipelines. There is no change proposed to crude oil throughput at the Carson Operations. However, at the Wilmington Operations, the crude oil unloading rate is proposed to be increased from the current rate of 5,000 bbl/hour to 15,000 bbl/hour, two new 300,000 bbl internal floating roof tanks are proposed, and 12-inch piping is proposed to be replaced with 24-inch piping within the Wilmington Operations. There are several benefits to be realized from increasing the crude unloading rate of marine vessels (i.e., ships). It decreases demurrage costs for detaining a marine vessel longer than necessary to unload its cargo. Decreasing demurrage translates directly into decreased marine vessel emissions as further described below. Additionally, as discussed in Section 4.1, a potential increase of up to 6,000 bbl/day of crude oil processing may occur at the Wilmington Operations as a result of the proposed project. The impacts of the proposed change in unloading rate and crude oil processing capability affect only Wilmington Operations and are analyzed herein.

Currently, the 5,000 bbl/hour transfer rate during crude oil unloading at the Wilmington Operations is limited by the vapor recovery system capacity on the fixed-roof crude oil storage tanks. Crude oil at the Wilmington Operations is currently stored in 16 fixed-roof storage tanks that are connected to vapor recovery and four internal floating roof tanks that are not required to be connected to vapor recovery. When a fixed-roof tank is filled, the displaced vapors are controlled in the vapor recovery system. The new internal floating roof tanks would allow marine vessels to unload at a faster rate of approximately 15,000 bbl/hour, which will reduce the amount of time the marine vessel needs to spend at berth or in the harbor and the associated marine vessel emissions per marine vessel visit. Marine vessel emissions while in transit to and from the berth will not be affected by the increase in crude unloading rate.

The Wilmington Operations currently receives crude oil shipments only in vessels of two size classes, Panamax (400,000 bbl capacity) and Aframax (720,000 bbl capacity) and will continue to receive crude oil in the same size vessels once the new tanks and pipeline within the Wilmington Operations become operational. Marine vessels larger than an Aframax cannot be handled at the Long Beach Marine Terminal because of its location within the Port of Long Beach and the water depth at the Marine Terminal location. The Wilmington Operations typically offload their entire allocation of crude oil on the marine vessel in one visit. Since there are currently no proposals by the Port of Long Beach to change the size of the berth and the water depth, these two factors are not expected to change at the Marine Terminal. Historically, marine vessel berth time has varied with an average of approximately 79 hours per marine vessel, which is expected to be reduced by up to 60 percent by improving the unloading rate from approximately 5,000 bbl/hour to approximately 15,000 bbl/hour, provided that all of the shipment is unloaded into the new and existing internal floating roof tanks. If a portion of the crude oil is unloaded into fixed roof tanks, the percentage reduction would be less (i.e., reduced by approximately 56 percent instead of 60 percent). Thus, the marine vessel emissions associated with auxiliary engines and boilers used while hoteling will be less. All other emissions associated with marine vessel deliveries (e.g., transiting, maneuvering, docking, etc.) are expected to remain the same. Peak day emissions occur when the marine vessel is transiting.

Since no change in transiting activities is included in the proposed project, no change to peak day emissions is expected.

Two aspects of the proposed project have the potential to affect marine vessel emissions: (1) increasing the offloading rate is expected to decrease hoteling time and associated emissions, and (2) additional deliveries to accommodate the increased crude oil throughput of 6,000 bbl/day are expected to increase annual emissions. To analyze the net effect of the change in marine vessel activities, emissions per marine vessel visit as well as the annual deliveries were analyzed using the following methodology.

Since the proposed project does not affect the peak daily emissions, which occur while the marine vessel is transiting the harbor, the emission effects of unloading crude more quickly are best presented on a per marine vessel visit basis, converted to emissions per 1,000 bbl unloaded per trip. Emissions tabulated per marine vessel visit include inbound transit, maneuvering, docking, hoteling, outbound transit, and associated assist tugs. Table 4.2-9 contains a comparison of marine vessel emissions per 1,000 bbl unloaded. The analysis compares the emissions from delivery activities associated with the two types of marine vessels that currently deliver crude oil with the emissions from delivery activities with the faster unloading rate following implementation of the proposed project. Note that any unloading that would occur at the same rate as the current rate (i.e., 5,000 bbl/hr) would have the same emissions as current operations, so no emissions reduction per 1,000 bbl unloaded would occur. To unload the same volume of crude oil, a marine vessel would be in port at berth for less time under the proposed project. On a marine vessel visit basis (emissions per 1,000 bbl unloaded), emissions reductions for all pollutants are expected from the change from current marine vessel activities to the marine vessel activities once the proposed project is implemented (see Table 4.2-9 and Appendix B-5 for more detailed calculations). Considering the cargo capacity of Panamax and Aframax, emission reductions per marine vessel visit would be substantial.

The second parameter that would affect crude delivery marine vessel emissions is the potential increase of two percent (6,000 bbl/day) of crude oil processed at the DCU in the Wilmington Operations. This two percent increase represents approximately 2.2 million bbl/yr (calculated as 6,000 bbl/day x 365 days/yr = 2.19 million bbl/yr). To accurately assess the potential change in marine vessel emissions associated with delivery of the additional crude oil in a given year, the maximum number of additional marine vessels per year needed to transport the additional crude oil would be either six Panamax (5.5 marine vessels x 400,000 bbl/marine vessel) or three Aframax (3 marine vessels x 720,000 bbl/marine vessel). As discussed previously, the peak daily emissions associated with a marine vessel visit (when a marine vessel is transiting) are not expected to change, only annual emissions would be affected.

TABLE 4.2-9

Comparison of Existing and Project Marine Vessel Emissions per Visit

Marine Vessel Size	Emissions (lb/1,000 bbl unloaded)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Panamax - Project	0.9	2.1	23.8	0.8	0.11	0.09
Panamax - Existing	1.0	2.4	27.1	1.3	0.15	0.12
Panamax - Change[(a)]	-0.1	-0.3	-3.3	-0.5	-0.03	-0.03
Aframax - Project	0.6	1.5	16.7	0.7	0.09	0.07
Aframax - Existing	0.7	1.8	19.9	1.2	0.12	0.10
Aframax - Change[(a)]	-0.1	-0.2	-3.2	-0.6	-0.04	-0.03

Note: Negative numbers represent emission reductions. See Appendix B-5 for further details.

(a) Existing/Project is the difference in the marine vessel emissions for the specified size from current activities compared to the expected emissions from marine vessel activities once the proposed project is implemented. The current unloading rate is 5,000 bbl/hour and the proposed unloading rate is 15,000 bbl/hour for transfer to internal floating roof storage tanks. The marine vessel sizes presented are those that are currently used and will continue to be used at the Terminal. No change in marine vessel size can be accommodated at the Terminal because of physical limitations (e.g., water depth).

Table 4.2-10 presents the volume of crude oil received at the Marine Terminal for the Wilmington Operations during 2012 and 2013. On average approximately 11 million bbl/yr of crude oil were delivered to the Wilmington Operations in 2012-2013. While Panamax and Aframax will continue to deliver crude oil to the Wilmington Operations, the future number of each type of marine vessel visiting the Marine Terminal is unknown, making precise quantification of emission reductions difficult. However, an analysis where all of the annual crude deliveries are made by Panamax marine vessels compared to an analysis where all of the annual crude deliveries are made by Aframax marine vessels will capture the maximum annual marine vessel emission reductions per 1,000 bbl compared to the minimum annual marine vessel emission reductions per 1,000 bbl, respectively. As shown in Table 4.2-11, on an annual basis, marine vessel emission decreases are expected from the proposed project. See Appendix B-5 for additional information regarding calculating marine vessel emissions before and after implementing the proposed project. The net emission reductions effects take into account the additional marine vessel trips per year resulting from the two percent crude throughput increase for both types of crude delivery marine vessels as well as the faster offloading rate. As discussed in Chapter 2, no changes to the Crude Units are being made that would affect the crude oil throughput of the Wilmington Operations and the only change to crude oil throughput from the proposed project is the potential of up to 2.2 million bbl/yr analyzed herein. Thus, the emissions reduction from the reduced hoteling sufficiently compensates for the additional marine vessels potentially needed to deliver the 2.2 million bbl/yr of crude and also reduce marine vessel emissions annually.

TABLE 4.2-10

Crude Oil Deliveries via Marine Vessel to the Marine Terminal

Year	Volume (million bbl)
2012	12.616
2013	9.254
2012/2013 Average	10.940

Source: EIA, 2015.

TABLE 4.2-11

Comparison of Current and Post-Project Marine Vessel Emissions on an Annual Basis

Marine Vessel Size	Emissions (lb/yr/1,000 bbl unloaded)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Panamax - Project[(a)]	9.6	23.1	260.8	8.5	1.2	1.0
Panamax - Existing	13.2	31.8	356.1	16.5	1.9	1.6
Panamax - Change[(a)]	-3.6	-8.6	-95.3	-8.0	-0.7	-0.6
Aframax - Project[(a)]	6.9	16.9	182.3	7.1	1.0	0.8
Aframax - Existing	9.8	23.3	261.0	16.1	1.6	1.3
Aframax - Change[(b)]	-2.9	-6.5	-78.6	-9.0	-0.7	-0.6

Note: Negative numbers represent emission reductions. See Appendix B-5 for further details.

(a) Project emissions include the effects of the increase in annual emissions from increasing the number of marine vessel visits per year due to the two percent increase in crude throughput minus the reduction in annual emissions from the reduced time necessary to offload the crude.

(b) The actual mix of Panamax and Aframax varies. The comparison shows the range of emission reductions if all the crude oil was delivered by a single marine vessel type. The actual emission reductions would be within the range shown.

Unmitigated daily operational emission effects from all proposed project emissions sources are summarized in Table 4.2-4, together with the SCAQMD daily operational significance thresholds. The operation of the proposed project is not expected to exceed any significance thresholds. Additionally, vehicle and rail emissions outside the SCAQMD jurisdiction summarized in Table 4.2-8 are not expected to exceed any applicable AQMD/APCD significance thresholds. Therefore, the air quality impacts associated with operational emissions from the proposed project are not considered significant.

4.2.2.3 CO Hot Spots

The potential for high concentration of CO emissions associated with truck/vehicle traffic was considered and evaluated per the requirements of the SCAQMD CEQA Air Quality Handbook

(SCAQMD, 1993). The Handbook indicates that any project that could negatively impact levels of service at local intersections may create a CO hot spot and should be evaluated. As evaluated in Section 4.7, no changes in level of service are expected from the proposed project following mitigation. Therefore, no significant adverse impacts to ambient CO air quality due to the traffic impacts at intersections in the vicinity of the proposed project are expected, so no mitigation is required.

4.2.2.4 Localized Air Quality Impacts

Dispersion modeling was used to calculate ambient air concentrations of the criteria pollutants from the proposed project on-site stationary sources and on-site rail emissions, which emit CO, NOx, SOx, PM10, and PM2.5 emissions and to determine the localized air quality impacts. In order to determine ground-level concentrations, the U.S. EPA AERMOD (version 15181, which is the most recent version available at the time of the analysis) air dispersion model was used to predict the ambient concentrations for CO, NOx, SOx, and PM10 (ambient air quality standards have not been established for VOC and therefore is not required to be modeled). Since PM2.5 emissions are a fraction of PM10 emissions and the significance thresholds are the same for PM10 and PM2.5, PM2.5 emissions were not modeled but were based on the modeling results for PM10.

Emissions of CO, NOx, SOx, and PM10 were modeled using the appropriate averaging times for each pollutant. Averaging times modeled include one, eight, and 24 hours and annual, which are based on the averaging times used to derive the applicable ambient air quality standard. The emission rates, locations, and ground-level concentrations are included in Appendix B-3. The calculated impacts of the proposed project on ambient air pollutant concentrations of the modeled criteria pollutants are presented in Table 4.2-12.

Based on the AERMOD air dispersion model results, the ground-level concentrations of the criteria pollutants of concern will be below SCAQMD CEQA significance thresholds at all off-site receptor locations. Therefore, no significant adverse localized air quality impacts are anticipated to occur from the operation of the proposed project.

4.2.2.5 Toxic Air Contaminants

A health risk assessment (HRA) was performed to determine if emissions of TACs generated by the proposed project would exceed the SCAQMD thresholds of significance for cancer risk and hazard indices (for non-cancer health impacts). The following subsections outline the HRA methodology. A summary of the results of the HRA are presented in Table 4.2-13. The HRA evaluated the emissions associated with the operation of the proposed project and determined the carcinogenic and non-carcinogenic impacts for all off-site receptors are expected to be less than the applicable significance thresholds. The HRA summarized herein evaluates only the emission increases from the proposed project, and does not take emission reduction credit for emissions decreases associated with proposed project components. This approach provides a conservative analysis of the proposed project impacts. A detailed HRA can be found in Appendix B-4.

TABLE 4.2-12

Results of Criteria Pollutants Air Quality Modeling

Criteria Pollutant	Averaging Period	Modeled GLC ($\mu g/m^3$)	Background GLC. ($\mu g/m^3$)[(a)]	Total GLC ($\mu g/m^3$)	Most Stringent Air Quality Standard ($\mu g/m^3$) [(b)]	Exceeds LST Threshold?
CO	1-hour	10.4	4,809.0	4,819.4	23,000	No
	8-hour	3.6	2,977.0	2,980.6	10,000	No
NO_2[(c)]	1-hour	45.9	255.5	301.4	339	No
	1-hour (Fed.)[(d)]	38.6	146.3[(e)]	184.9	188	No
	Annual	2.1	47.6	49.7	57	No
SO_2	1-hour	6.5	64.9	71.4	655	No
	1-hour (Fed.)[(f)]	6.5	40.0	46.6	196	No
	24-hour	0.6	64.9	65.5	105	No
PM10	24-hour	0.42	--	--	2.5	No
	Annual	0.16	--	--	1.0	No
PM2.5	24-hour	0.42	--	--	2.5	No

(a) South Coastal LA County 3 years 2012-2014. Maximum value of the three years was used, except concentrations used to compare with federal standards were averages.
(b) SCAQMD CEQA thresholds. For PM10 and PM2.5, project comparison to incremental change.
(c) Impacts from air dispersion model are reported as NOx. NO_2 converted from NOx by using default factor of 0.8 for hourly and 0.75 for annual, per 9/30/2014 Memorandum from R Chris Owen and Roger Brode, U.S. EPA Air Quality Modeling Group, to Regional Air Division Directors re: Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO2 NAAQ.
(d) Federal standard is the 98th percentile concentration, averaged over three years.
(e) 98th percentile background NO_2 value from the SCAQMD.
(f) Federal standard is the 99th percentile concentration, averaged over three years.

TABLE 4.2-13

Tesoro Refinery
HRA Results

Maximally Exposed Individual[(a)]	Increased Cancer Risk (per million)	Chronic Hazard Index	8-Hour Chronic Hazard Index	Acute Hazard Index[(b)]
Residential Receptor[(c)]	3.6	0.049	0.006	0.052
Off-site Workplace Receptor	9.2	0.127	0.108	0.052
Sensitive Receptors[(d)]	2.1	0.054	0.005	0.010
Significance Threshold	**10**	**1.0**	**1.0**	**1.0**
Significant?	**No**	**No**	**No**	**No**

(a) Excludes onsite grid receptors.
(b) Fenceline receptors were conservatively included as potential residential and worker receptors for determination of maximum acute risk.
(c) Worst-case residential receptor.
(d) Maximum non-residential sensitive receptors: Cancer risk: Bethune Mary School; Chronic risk: Long Beach Japanese School; 8-Hr Chronic Risk: Bethune Mary School; and, Acute risk: Bethune Mary School

HRA Methodology

The HRA analysis for the proposed project began prior to the release on March 6, 2015, of the update to the HRA guidance by the Office of Environmental Health Hazard Assessment (OEHHA). The 2015 OEHHA Air Toxics Hot Spots Program Guidance Manual contained substantial changes to the HRA methodology relating to health effect values, exposure pathway variates (e.g., breathing rates), application of weighting to early age exposure (i.e., a ten-fold adjustment factor for less than two years of age and three-fold adjustment factor for two to sixteen years of age), and adjustment of exposure duration for residential and occupational worker receptors. Formal guidance has been developed by the SCAQMD for implementing the OEHHA updated guidance and was approved by the SCAQMD Governing Board on June 5, 2015. The HRA conforms with the 2015 SCAQMD guidance. The HRA includes a comprehensive analysis of the dispersion of certain AB2588-listed compounds into the environment, the potential for human exposure, and a quantitative assessment of individual health risks associated with the predicted levels of exposure. CARB Hotspots Analysis Reporting Program (HARP2, version 15197) model is the most appropriate model for determining the air quality impacts from the proposed project (CARB, 2015).

The HARP model is well suited for refinery modeling since it can accommodate multiple sources and receptors. The HARP2 model utilizes AERMOD to determine ground-level concentrations used in the health risk calculations. Consistent with SCAQMD modeling guidance, increased cancer risks associated with locomotive diesel particulate matter (DPM) exhaust emissions were determined using a simplified approach. AERMOD was used to calculate ambient DPM concentrations associated with locomotive activity, and the resulting DPM concentrations at each receptor were multiplied by composite risk factors to calculate increased cancer risks for residential and off-site worker exposure. The model default values were modified to conform to the SCAQMD Supplement Guidelines for Preparing Risk Assessment for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) (SCAQMD, 2015b).

A complete description of the HRA methodology is provided in Appendix B-4.

Hazard Identification

The proposed project generates various air contaminants. Some of these chemical compounds are potentially carcinogenic, non-carcinogenic (adverse health effects other than cancer, such as birth defects, reproductive defects, mutagenicity, etc.), toxic, or hazardous, depending on concentration or duration of exposure. Numerous federal, state, and local regulatory agencies have developed lists of TACs. The list of potentially-emitted substances considered in the preparation of the HRA for the proposed project is identified in Appendix A-I of the CARB AB2588 requirements and by OEHHA. The AB2588 TACs emitted from the proposed project are shown in Appendix B-3. Some of these pollutants were consolidated into one category, e.g., polycyclic aromatic hydrocarbons (PAHs). Health effects data are not available for all compounds. However, a total of 71 TACs were included in the air dispersion modeling (see Appendix B-3). For carcinogens, slope factors were used to compute cancer risk through inhalation. If the carcinogen is a multi-pathway pollutant, a potency slope was used for estimation of risk from non-inhalation pathways. For non-cancer health effects, reference

exposure levels (REL) and acceptable oral doses (for multi-pathway pollutants) were used. The non-carcinogenic hazard indices were computed for chronic and acute exposures with their respective toxicological endpoints shown.

Emission Estimations and Sources

The purpose of the HRA for the proposed project was to evaluate the risk associated with changes in emissions resulting from the integration of the Wilmington and Carson Operations. Emission changes are summarized below:

Modified combustion sources: Hourly emission rates from modified sources were based on the actual 2012/2013 *daily* emissions compared to maximum potential-to-emit emissions once the proposed project becomes operational. Annual emission rates were based on actual 2012/2013 *annual* emissions compared to potential-to-emit emissions once the proposed project becomes operational.

Non-modified combustion sources: Emission rates for equipment not modified as part of the proposed project, but where an increase in operational activity is expected were estimated based on the anticipated increase in operating rate of the unit.

Storage tanks: Pre-project storage tank emissions from existing tanks were based on 2012/2013 actual daily emissions; project storage tank emissions were based on estimated maximum potential-to-emit emissions upon operation of the proposed project.

Process unit piping component fugitives: Total daily emissions were based on emission rates and the number and type of piping components to be installed.

Locomotive DPM: Emissions increase in DPM was based on the estimated increase in locomotive activity associated with increased railcar movement of LPG, in-transit and idling on-site and just outside facility fence line.

New Emission Sources: Emission rates for new sources (e.g., Wet Jet Treater at the Carson Operations; and PSTU, and SARP at the Wilmington Operations) were based on maximum potential-to-emit emissions on hourly and annual emissions.

Details of the emission calculations for stationary sources and locomotive-related emissions are presented in Appendix B-3.

Cancer Risk Analysis

The predicted increase in health risks at maximally exposed off-site receptors using HARP2 models are summarized by category in Table 4.2-13. The maximum cancer risk from the proposed project for an exposed individual resident (MEIR) is located just west of the western boundary of the Refinery nearest to the new crude tanks. The increased incremental cancer risk is 3.6 in one million at the MEIR, which is below SCAQMD's 10 in one million significance

threshold. Therefore, the cancer risk at the MEIR is not significant. Detailed cancer risk contributions are presented in Appendix B-4.

The maximum incremental increase in cancer risk from the proposed project at the occupational maximum exposed individual worker (MEIW) (off-site worker) receptor is located near the railroad tracks at the northeastern boundary of the facility. The increased incremental cancer risk is 9.2 in one million at the MEIW which is below SCAQMD's 10 in one million significance threshold. Therefore, the cancer risk at the MEIW is not significant. Detailed cancer risk contributions are presented in Appendix B-4.

The maximum cancer risk from the proposed project for a non-residential sensitive receptor is located at Bethune Mary School, which is approximately 100 meters east of the eastern boundary of the Wilmington Operations. The increased incremental cancer risk is 2.1 in one million at Bethune Mary School which is below SCAQMD's 10 in one million significance threshold. Therefore, the cancer risk at the nearest non-residential sensitive receptor is not significant. Detailed cancer risk contributions are presented in Appendix B-4.

Cancer Burden

Cancer burden was calculated to estimate the increase in cancer cases in the population. Cancer burden was conservatively estimated by using as a screening calculation, where a default residential population density (for residential and commercial/industrial areas) and the worst-case cancer risk were combined. The cancer burden was calculated to be 0.44, which is below the SCAQMD's significance threshold of 0.5. Therefore, the cancer burden is not significant. Additional discussion of the cancer burden calculation is presented in Appendix B-4.

Non-Cancer Risk Analysis

The analysis of non-cancer health impacts is performed using a different methodology than a cancer risk analysis. Non-cancer health risk estimates are shown in terms of a hazard index (HI), either maximum chronic HI for long-term exposures or maximum acute HI for short-term exposures (one hour) to non-carcinogenic TAC emissions.

The maximum chronic hazard index (MCHI) is located just east of the southern portion of the facility. The MCHI for the proposed project is 0.127, which is below SCAQMD's chronic hazard index significance threshold of 1.0. Therefore, the peak chronic non-cancer health hazards generated by the proposed project are considered to be less than significant. Detailed contribution to the chronic hazard index for the maximum receptor location is presented in Appendix B-4.

The maximum 8-hour chronic hazard index is located on the northwestern boundary of the Wilmington Operations. The maximum 8-hour chronic hazard index for the proposed project is 0.108, which is below SCAQMD's chronic hazard index significance threshold of 1.0. Therefore, the peak chronic non-cancer health hazards generated by the proposed project are considered to be less than significant. Detailed contribution to the chronic hazard index for the maximum receptor location is presented in Appendix B-4.

The maximum acute hazard index (MAHI) is located just west of the southern portion of the facility. The MAHI for the proposed project is 0.052, which is below the 1.0 significance threshold. Therefore, the acute hazards generated by the proposed project are considered to be less than significant. Detailed contribution to the acute hazard index for the maximum receptor location is presented in Appendix B-4.

4.2.2.6 Summary of Health Impacts

The health impacts related to air quality impacts from the proposed project have been evaluated in several ways. First, the short-term air quality impacts related to construction emissions were evaluated by comparing the peak day construction emissions to the SCAQMD mass daily significance thresholds. In the short-term, the air quality impacts related to construction emissions would exceed the SCAQMD significance thresholds for VOC, CO, and NOx and are considered to have a significant air quality impact. In order to evaluate the health impacts associated with criteria pollutant construction emissions, an LST analysis was also completed. The results of the LST analysis indicated that the short-term construction emissions would exceed the applicable LST NO_2 significance thresholds. The LST significance thresholds for NO_2 is based on the most stringent ambient air quality standard for NO_2, which in turn are based on the pollutant concentration observed to cause adverse human health effects (see Table 3.2-1). Since the area of the SCAQMD's jurisdiction is non-attainment for PM2.5 and PM10, a different LST methodology was used to derive their construction and operational significance thresholds (SCAQMD, 2008). Since construction of the proposed project is short-term and would exceed the LST significance thresholds for local ambient air quality, adverse health impacts associated with construction emissions could occur in industrial and residential areas or pedestrian walkways near the Refinery. The primary health effects associated with exposure to VOC, NO_2, and CO, are respiratory impacts including decreased lung function, aggravation of chronic respiratory condition, and aggravation of heart disease conditions. Any adverse health impacts are only expected during the construction phase of the proposed project and would only be temporary. Upon completion of construction, operational VOC, NO_2, and CO, emissions are considered less than significant, so localized operational air quality impacts for these pollutants were concluded to be less than significant.

The long-term air quality impacts from exposure to toxics were evaluated through the preparation of an HRA. The HRA evaluated toxic air contaminant emissions associated with the operation of the proposed project and compared them to carcinogenic and non-carcinogenic significance thresholds to determine potential health impacts. As demonstrated in the HRA, the carcinogenic and non-carcinogenic impacts for all receptors are expected to be less than the applicable significance thresholds. Therefore, no significant adverse carcinogenic or non-carcinogenic health impacts associated with the operation of the proposed project are expected.

Epidemiological analyses have consistently linked air pollution, especially PM, with excess mortality and morbidity. Health studies have shown both short-term and long-term exposures of ambient PM concentrations are directly associated with increased mortality and morbidity. Since the air quality analysis shows that the operational PM emissions from the proposed project are not changing and do not have off-site consequences (i.e., no concentrations above the ambient air

quality standards), no increase in morbidity or mortality rates or related health effects are anticipated.

The indirect PM emissions associated with the proposed project are limited to an increase in truck trips and railcars. The potential annual increase in truck trips or railcars does not produce a localized increase in PM, but is dispersed along the route. Therefore, no significant air quality and corresponding health impacts are expected due to the proposed project.

4.2.3 MITIGATION MEASURES

Feasible mitigation measures are required, if available, to minimize the significant air quality impacts associated with the construction phase of the proposed project as the emissions of VOC, CO, and NOx are considered significant.

As shown in Table 4.2-4, upon completion of the proposed project, operation of the proposed project will result in operational emission reductions for CO, and less than significant increases in VOC, NO, and SOx, PM10, and PM2.5 of 2.46 lb/day, 52.05 lb/day, less than 0.01 lb/day, 5.05 lb/day, and 1.94 lb/day, respectively, from mobile sources associated with the proposed project. As shown in Table 4.2-6, the 90-day transitional period associated with integrating the Refinery and shutting down the Wilmington Operations FCCU, will overlap with construction activities. The employment of the construction mitigation measures identified below will reduce construction impacts. No significant operational impacts were identified. Therefore, no operational mitigation is required; however, to reduce the construction emissions impacts, one feasible operational mitigation measure has been identified and imposed.

Construction Mitigation Measures

The proposed project is expected to have significant adverse air quality impacts during the construction phase. While the construction schedule of the proposed project spans approximately five years, most of the project construction will be completed in the first two years to facilitate the retiring of the Wilmington Operations FCCU. While construction emissions are significant, once the Wilmington FCCU is shut down, the local emissions benefit from the shutdown is far greater than the temporary localized construction emissions. Therefore, the following mitigation measures will be imposed on the project to reduce emissions associated with construction activities from heavy construction equipment and worker travel.

A-1 Maintainthe Construction Management Program for the proposed project that shall, at a minimum, incorporate the following mitigation measures and Best Management Practices.

<u>On-Road Mobile Sources:</u>

A-2 Prohibit vehicles from idling longer than five minutes at the Refinery as contract conditions with construction companies and by posting signs on-site, except as provided in the exceptions in the applicable CARB regulations regarding idling.

A-3 All on-road heavy-duty diesel trucks or equipment with a gross vehicle weight rating (GVWR) of 19,500 pounds or greater shall comply with EPA 2007 on-road emission standards for PM and NOx (0.01 gram per brake horsepower - hour (g/bhp-hr) and at least 0.2 g/bhp-hr, respectively).

Off-Road Mobile Sources:

A-4 Prohibit construction equipment from idling longer than five minutes at the Refinery as contract conditions with construction companies and by posting signs on-site, except as provided in the exceptions in the applicable CARB regulations regarding idling.

A-5 The project proponent shall survey and document the proposed project's construction areas and identify all construction areas that are served by electricity. This documentation shall be provided as part of the Construction Emissions Management Plan. Electric welders shall be used in all construction areas that are demonstrated to be served by electricity.

A-6 The project proponent shall survey and document the proposed project's construction areas and identify all construction areas that are served by electricity. This documentation shall be provided as part of the Construction Management Program. On-site electricity rather than temporary power generators shall be used in all construction areas that are demonstrated to be served by electricity.

A-7 For off-road construction equipment rated greater than 50 hp, the project proponent shall use equipment that meets Tier 4 off-road emission standards at a minimum. Any emissions control device used by the Contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. The project proponent shall provide documentation in the Construction Emissions Management Plan or associated subsequent status reports as information becomes available that equipment rated greater than 50 hp equipped with Tier 4 engines are not available.

A-8 Suspend use of all construction activities that generate air pollutant emissions during first stage smog alerts.

Exceptions

Mitigation measure A-2 through A-8 for on-road and off-road construction equipment and generator requirements shall apply unless any of the following circumstances exist and the project proponent and its contractor provides a written finding consistent with project contract requirements that:

1) The project proponent and its contractor intends to meet the requirements of these mitigation measures as to a particular vehicle or piece of equipment by leasing or short-term rental, and the project proponent and its contractor has attempted in good faith and due diligence to lease the vehicle or equipment that would comply with this policy, but that vehicle or equipment is not available for lease or short-term rental within 200 miles of the project site, and the Contractor has submitted documentation to Tesoro showing that the requirements of this Exception provision apply; or

2) The contractor has been awarded funding by SCAQMD or another agency that would provide some or all of the cost to retrofit, repower, or purchase a piece of equipment or vehicle, but the funding has not yet been provided due to circumstances beyond the contractor's control, and the contractor has attempted in good faith and due diligence to lease or short-term rent the equipment or vehicle that would comply with this policy, but that equipment or vehicle is not available for lease or short-term rental within 200 miles of the project site, and the contractor has submitted documentation to Tesoro showing that the requirements of this Exception provision apply; or

3) The contractor has ordered for purchase, a piece of equipment or vehicle to be used on the construction project in compliance with this policy at least 60 days before that equipment or vehicle is needed at the project site, but that equipment or vehicle has not yet arrived due to circumstances beyond the contractor's control, and the contractor has attempted in good faith and due diligence to lease or short-term rent a piece of equipment or vehicle to meet the requirements of this policy, but that equipment or vehicle is not available for lease or short-term rental within 200 miles of the project, and the contractor has submitted documentation to Tesoro showing that the requirements of this Exception provision apply; or

4) Construction-related diesel equipment or vehicles will be used on Tesoro construction project site for fewer than 10 calendar days per calendar year. The contractor shall not consecutively use different equipment or vehicles that perform the same or a substantially similar function in an attempt to use this Exception to circumvent the intent of this policy.

In any of the Mitigation Measures and Exceptions described above, the contractor shall provide the next cleanest piece of equipment or vehicle as provided by the step down schedules in Table A for Off-Road Equipment and Table B for On-Road Equipment.

Table A. Off-Road Compliance Step Down Schedule*

Compliance Alternative	Engine Standard	CARB-Verified DECS (VDECS)
1	Tier 4	N/A
2	Tier 3	Level 3
3	Tier 2	Level 3
4	Tier 1	Level 3
5	Tier 2	Level 2
6	Tier 2	Level 1
7	Tier 2	Uncontrolled
8	Tier 1	Level 2
Equipment less than Tier 1, Level 2 shall not be permitted.		

Table B. On-Road Compliance Step Down Schedule*

Compliance Alternative	Engine Model Year	CARB-Verified DECS (VDECS)
1	2010	N/A
2	2007	N/A
3	2004	Level 3
4	1998	Level 3
5	2004	Uncontrolled
6	1998	Uncontrolled
Equipment with a model year earlier than Model Year 1998 shall not be permitted.		

*How to use Table A and Table B: For example, if Compliance Alternative #3 is required by this policy but a Contractor cannot obtain an off-road vehicle that meets the Tier 2 engine standard that is equipped with a Level 3 DECS (Compliance Alternative #3 in Table A) and meets one of the above exceptions, then the Contractor shall use a vehicle that meets the next compliance alternative (Compliance Alternative #4) which is a Tier 1 engine standard equipped with a Level 3 DECS. Should the Contractor not be able to supply a vehicle with a Tier 1 engine equipped with a Level 3 DECS in accordance with Compliance Alternative #4 and has satisfied the requirements of one of the above exceptions as to the Contractor's ability to obtain a vehicle meeting Compliance Alternative #4, the Contractor shall then supply a vehicle meeting the next compliance alternative (Compliance Alternative #5), and so on. If the Contractor is proposing an exemption for on-road equipment, the step down schedule in Table B should be used. A Contractor must demonstrate that it has satisfied one of the exceptions listed in the selected Compliance Alternative # before it can use a subsequent Compliance Alternative. The goal is to ensure that the Contractor has exercised due diligence in supplying the cleanest fleet available.

Best Management Practices

In addition to equipment requirements, the Best Management Practices (BMPs) listed below are to be included in the Construction Management Program and imposed on all construction projects performed on Tesoro properties and rights-of-way.

BMPs shall include, at a minimum:

1) Maintain equipment according to manufacturers' specifications;

2) Restrict idling of construction equipment and on-road heavy-duty trucks to a maximum of 5 minutes when not in use, except as provided in the exceptions to the applicable CARB regulations regarding idling for off-road and on-road equipment;

3) Maintain a buffer zone that is a minimum of 1,000 feet between truck traffic and sensitive receptors, where feasible;

4) Prohibit parking on public streets.

5) Prepare haul routes that conform to local requirements to minimize traversing through congested streets or near sensitive receptor areas;

6) Schedule construction activities that affect traffic flow on the arterial system to off-peak hours to the extent practicable;

7) Use electric power in lieu of diesel power where available; and

8) Traffic speeds on all unpaved roads to be 15 mph or less.

Stationary Source Mitigation

Once direct construction mitigation is implemented, the duration of significant NOx emissions will be reduced from the first 30 months to the first 24 months of construction. In addition to mitigation measures directly reducing emissions from construction equipment, Tesoro examined possible operational mitigation measures to further mitigate NOx emissions during construction of the proposed project. The identified feasible operational mitigation is the early implementation of NOx reduction projects that are planned for future regulatory compliance. Tesoro has determined that it can upgrade or change the catalyst in three SCRs currently operating as emission controls for NOx, to obtain some of the emission reductions needed to implement the recently adopted RECLAIM NOx amendments. The catalyst change-outs and subsequent NOx reductions were not scheduled to be implemented until the first quarter of 2020 or later, but will be implemented per the schedule in mitigation measure A-9. While costly, these change-outs were scheduled because they could be implemented without causing any additional major facility shutdowns or outages (which could cause additional emissions). These change-outs would not require additional approvals and would not require major construction

and, thus, not add to the already significant construction emissions from the proposed project. Tesoro shall comply with the following mitigation measure:

A-9 Tesoro will implement the following early SCR catalyst change-outs to improve NOx reduction according to the schedule in Table 4.2-14.

TABLE 4.2-14

SCR Catalyst Replacement Schedule

Location	Unit	Completion Date
Carson Operations	Hydrogen Plant #2	Prior to start of construction
Wilmington Operations	HGU-2	Six months following project approval
Carson Operations	Cogen GTG Unit 91	Nine months following project approval

The stationary source mitigation combined with the construction mitigation measures reduces the duration of significant NOx emissions to the first 20 months of construction. Implementation of the SCR catalyst change-outs identified in Mitigation Measure A-9 is expected to reduce NOx emissions from the units listed above from 40,000 to 49,000 lbs/yr compared to recent (2015) levels, once all three change-outs have been completed.

Other Mitigation Measures

During the course of construction, process units with combustion sources will be shutdown to accomplish the project modifications. Therefore, varying temporary emission reductions will occur. Emission reductions will vary depending on the number of units that are shutdown concurrently. Therefore, while the reductions are quantifiable, the emission reductions do not directly offset peak construction emissions and will not be accumulated and counted as mitigation emissions reductions. Table 4.2-15 shows the ranges of emission reductions from not operating refinery equipment that are expected to occur during the construction period. Unit shutdowns will vary during the construction period, with a wide range of emission reductions, but as previously indicated, will not be counted as mitigated construction emission reductions. Calculations for deriving the emission effects from equipment shutdowns during construction can be found in Appendix B-1.

Other mitigation measures were considered but were rejected because they would not further mitigate the potential significant impacts. These mitigation measures include: (1) implement a shuttle service to and from retail services during lunch hours (most workers eat lunch on-site and lunch trucks will visit the construction site); (2) use methanol, natural gas, propane or butane powered construction equipment (equipment is not CARB-certified or commercially available); and (3) pave unpaved roads (most Refinery roads are already paved).

TABLE 4.2-15

Emission Reductions from Unit Shutdowns During Construction (lb/day)

Pollutant	Range of Emissions Reduction
CO	50 – 432
NOx	42 – 240
SOx	5 – 255
VOC	19 – 102
PM10	14 – 100

Table 4.2-16 shows the minimum potential mitigated emissions. Since the pool of available Tier 4 equipment is limited, it is not certain that all construction equipment will be available that meets Tier 4 standards. However, Tier 4 off-road equipment will be used when available to mitigate the emissions during construction as required in Mitigation Measure A-7. The calculated mitigated emissions for off-road equipment assume that 50 percent of the construction equipment will be available with Tier 4 emissions-compliant engines and that 50 percent of the trucks associated with the construction will meet the 2010 emissions model year standards. It is expected that a greater percentage will be employed, thus reducing emissions further. The use of Tier 4 equipment and 2010 emissions model year on-road trucks would reduce construction emissions, but VOC and NOx emissions would remain significant. Therefore, during the 90-day transitional period, VOC and NOx emissions would remain significant.

4.2.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Construction emissions for the proposed project for VOC and NOx are expected to remain significant following mitigation. Unmitigated construction emissions of CO, SOx, PM10, and PM2.5 were shown to be less than significant and are expected to remain less than significant following mitigation. Construction emissions are expected to be short-term and they will be eliminated following completion of the construction phase.

Localized air quality significance impacts from construction activities were analyzed for CO, NO_2, PM10, and PM2.5. With implementation of all feasible mitigation measures, construction emissions of NO_2 are expected to remain significant at reduced emission levels. However, the mitigated construction emissions are not expected to reduce the localized air quality impacts to less than significant. Therefore, the construction activities associated with the proposed project are expected to cause significant adverse localized air quality impacts.

TABLE 4.2-16

Tesoro Refinery
Mitigated Peak Construction Emissions[(a)]
(lb/day)

ACTIVITY	VOC	CO	NOx	SOx	PM10	PM2.5[(b)]
Total Unmitigated Construction Emissions[(c)]	106.65	515.54	575.73	1.41	68.55	38.67
Mitigated Construction Emissions						
Construction Equipment	22.31	289.58	247.16	0.76	15.83	12.38
Vehicle Emissions	2.59	76.46	95.44	0.49	29.09	8.18
Fugitive Dust From Construction[(d)]	--	--	--	--	2.36	0.68
Fugitive Road Dust[(d)]	--	--	--	--	3.80	0.80
Architectural Coating	62.25	--	--	--	--	--
Stationary Source Mitigation	--	--	-27[(e)]	--	--	--
Total Emissions[(f)]	**87.15**	**366.04**	**315.60**	**1.25**	**51.08**	**22.04**
SCAQMD Threshold Level	75	550	100	150	150	55
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**

(a) Peak mitigated emissions for VOC predicted to occur in Month 25. Peak CO, NOx, SOx, PM10, and PM2.5 predicted to occur during Month 13.
(b) PM2.5 is determined using SCAQMD, 2006.
(c) From Table 4.2-2
(d) Assumes application of water three times per day.
(e) Minimum emissions reduction expected during the peak construction month. Actual reductions may be greater. In subsequent months additional NOx emission reductions will be implemented up to 109 lb/day by Month 19.
(f) The emissions in the table may differ slightly from those in Appendix B-1 due to rounding.

The potential for high concentration of CO emissions associated with truck/vehicle traffic was considered and evaluated per the requirements of the SCAQMD CEQA Air Quality Handbook (SCAQMD, 1993). The Handbook indicates that any project that could negatively impact levels of service at local intersections may create a CO hot spot and should be evaluated. As evaluated in Section 4.7, no changes in level of service are expected from the proposed project following traffic impact mitigation. Therefore, no significant adverse impacts to ambient air quality due to the traffic impact at intersections in the vicinity of the proposed project are expected.

During the 90-day transitional period, when construction activities are on-going, VOC and NOx emissions will remain significant. Therefore, the 90-day transitional period combined with construction activities associated with the proposed project are expected to cause significant adverse construction air quality impacts and no additional feasible mitigation has been identified that would reduce the localized impacts during construction.

The proposed project is not expected to generate significant adverse CO, NOx, SOx, VOC, PM10, or PM2.5 air quality during operation. Therefore, no mitigation measures are required for operational air quality impacts.

Operational localized air quality impacts from the proposed project were modeled for CO, NO_2, SOx, PM10, and PM2.5 emissions. The analysis demonstrated that the proposed project would not cause or contribute to an exceedance of any ambient air quality standard. Therefore, the operation of the proposed project is not expected to cause a significant adverse impact on ambient air quality and no mitigation measures are required.

The proposed project was analyzed for cancer and non-cancer human health impacts and determined to be less than significant. The estimated cancer risk due to the operation of the proposed project is expected to be less than the SCAQMD's cancer risk significance threshold of 10 in one million. The chronic and acute hazard indices are expected to be below the SCAQMD's chronic and acute hazard indices threshold of 1.0. Therefore, the proposed project is not expected to cause a potentially significant adverse impact associated with exposure to carcinogenic and non-carcinogenic TAC emissions.

4.3 HAZARDS AND HAZARDOUS MATERIALS

The NOP/IS (see Appendix A) determined that the proposed project at the Refinery has the potential to generate significant adverse hazards and hazardous materials impacts. The hazards and hazardous material impacts associated with the proposed project are evaluated in this section. The hazard analysis in Section 4.3 is based on the Worst-Case Consequence Analysis prepared for the proposed project and found in Appendix C.

4.3.1 SIGNIFICANCE CRITERIA

Hazards and hazardous materials impacts would be considered significant if the following occurs:

Non-compliance with any applicable design code or regulation.

Non-conformance to National Fire Protection Association standards.

Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.

Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

Exposure to radiant heat exposures in excess of 1,600 British Thermal Units (Btu)/(hr-ft^2) (the level that creates second degree burns on unprotected skin).

Overpressure exposure that exceeds one pound per square inch (gauge) (psig) (the level that would result in partial demolition of houses)

Flash fire hazard zones that exceed the lower flammable limit (LFL) (the level that would result in a flash fire in the event a flammable vapor cloud was ignited).

4.3.2 ENVIRONMENTAL IMPACTS

4.3.2.1 Process Unit, Storage Tank, and Related Hazards

The major types of public safety risks at the Refinery consist of risks from accidental releases of regulated substances and from major fires and explosions. The discussion of the hazards associated with the existing Refinery and proposed project relies on data in the Worst Case Consequence Analysis for the Tesoro Los Angeles Refinery (see Appendix C). The study has three tasks: (1) Determine the maximum credible potential accidental releases of hazardous materials, and their effects on existing process units, transfer systems, and storage areas; (2) Determine the maximum credible potential accidental releases of hazardous materials, and their consequences, for the modifications to the facility which have been proposed by Tesoro; and (3)

Determine whether the consequences associated with the proposed modifications generate potential hazards impacts that are larger or smaller than the potential hazards which currently exist.

The potential hazards associated with the proposed project are common to most oil processing facilities worldwide, and are a function of the materials being processed, processing systems, procedures used for operating and maintaining the facility, and hazard detection and mitigation systems. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and the process conditions. For hydrocarbon fuel and petrochemical facilities, the common hazards are: toxic gas clouds (e.g., gas with hydrogen sulfide, sulfur dioxide, or sulfur trioxide); flash fires; torch fires; pool fires; BLEVEs; and, vapor cloud explosions.

The endpoint hazard criteria used in this EIR correspond to hazard levels which might cause various types of injuries, depending upon the type of hazard. Table 4.3-1 presents the endpoint hazard criteria used by federal agencies and national associations for this type of analysis and that are used as significance thresholds in this EIR for determining whether or not potential hazard and hazardous materials impacts from the proposed project are significant.

TABLE 4.3-1

Consequence Analysis Hazards and Their Endpoint Hazard Criteria

Hazard Type	Injury Threshold		Reference
	Exposure Duration	Endpoint Hazard Criteria	
Sulfur Dioxide (SO_2) exposure	Up to 60 min	3 ppm	ERPG-2[(a)]
Sulfur Trioxide (SO_3) exposure	Up to 60 min	2.5 ppm	ERPG-2
Hydrogen Sulfide (H_2S) exposure	Up to 60 min	30 ppm	ERPG-2
Radiant heat exposure	40 seconds	1,600 Btu/(hr·ft^2)[(b)]	40 CFR 68[(c)]
Explosion overpressure	Instantaneous	1.0 psig[(d)]	40 CFR 68
Flash fires (flammable vapor clouds)	Instantaneous	Lower Flammable Limit	40 CFR 68

(a) ERPG2: The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action.

(b) Corresponds to second-degree skin burns.

(c) 40 CFR 86 corresponds to U.S. Environmental Protection Agency RMP endpoints.

(d) An overpressure of 1 psi may cause partial demolition of houses, which can result in serious injuries to people, and shattering of glass windows, which may cause skin laceration from flying glass.

In order to determine the hazards from the existing units, proposed new units, and modified units, the CANARY consequence analysis models were used. See Chapter 3.3 and Appendix C for more details on the model and related assumptions. The maximum vulnerability zones (also referred to as hazard zones) for the existing equipment before and after modifications have been made and for proposed new units are presented in Table 4.3-2, which lists the types of potential hazards (fires, thermal radiation, vapor cloud explosion or toxic release) from the new or modified units associated with the proposed project and the results of the modeling for these hazards. The maximum hazard zone identifies the area where the injury significance thresholds would be potentially exceeded in the event of an accidental upset. For each potential hazardous materials release, the distance to the significance threshold level was determined before and after the proposed project modifications (where applicable). For new units, the distance to the threshold level for each release was determined.

Table 4-3-2 shows that the hazard zones for many of the existing units that are part of the proposed project are the same size or larger compared to the hazard zones for these units after modification. New units (e.g., Wet Jet Treater at the Carson Operations; and PSTU, and SARP at the Wilmington Operations) do not have existing hazard zones, so the hazard zones for the proposed new units would represent new hazard zones.

The potential hazard zones from accidental releases originating inside the Carson Operations are dominated by the toxic hazards from the HCU and BLEVE hazard from the LPG Rail Unloading (see Figure 4.3-1). Potential hazard zones from accidental releases at the Wilmington Operation are dominated by toxic hazards in the CRU-3, PSTU, and SARP areas (see Figure 4.3-2).

With the maximum hazard zones defined for each release, the units can be divided into four categories dependent on their potential to create significant adverse off-site impacts to the public. The categories are defined as follows:

- **Units with No Potential Existing and No Post-Project Off-Site Impacts**: The process units that are in this category include the following units at the Carson Operations: Alkylation Unit, 51 Vacuum Unit, Wet Jet Treater; and Mid-Barrel Hydrotreater. The process units that are in this category include the following units at the Wilmington Operations: HTU-1, HTU-2, HTU-4, and modifications to existing crude tanks.

- **Units with Potential Existing and Post-Project Off-Site Impacts, but Post-Project Impacts Are Less Than or Equal to Existing Impacts:** The process units that are in this category at the Carson Operations include the HCU, Naphtha HDS, LHU, and Rail Loading/Unloading area. The process units that are in this category at the Wilmington Operations include the PSTU, CRU-3, and HCU.

- **Units with Potential Existing and Post-Project Off-Site Impacts but No Residential Exposure** (i.e., the post-project area of off-site impact is larger than the existing area of off-site impacts, but remains in industrial areas so that off-site workers in areas adjacent to the Refinery could potentially be exposed): The process units that are in this category at the

Carson Operations include the Naphtha Isomerization Unit and the new crude tanks. The hazards (flash fires) associated with the Interconnecting Pipelines (includes piping within and between the Wilmington and Carson Operations) also are in this category (see Figure 4.3-3) as the off-site impacts would be limited to streets adjacent to the Refinery, but within industrial areas.

- **New Units with Potential Off-Site Impacts with Potential Residential Exposure:** The modified SARP at the Wilmington Operations is the only proposed project component that falls into this category (see Figure 4.3-2).

TABLE 4.3-2

Maximum Hazard Distance for Maximum Credible Events in Each Process Unit[a]

Unit	Injury Threshold	Distance to Hazard (feet)		Hazard (Projected/ Existing)
		Projected	Existing	
Carson Operations				
51 Vacuum Unit	LFL	150	155	Flash Fire
Alkylation Unit	LFL	360	585	Flash Fire
HCU	30 ppm	1245	1250	Toxic (H_2S)
Mid-Barrel Distillate Treater	1,600 Btu/(hr·ft^2)/ 30 ppm	275	400	Torch Fire/ Toxic (H_2S)
Naphtha HDS	LFL	865	1035	Flash Fire
Naphtha Isomerization	LFL	665	530	Flash Fire*
LHU	LFL	600	585	Flash Fire
Wet Jet Treater	LFL	205	DNCE[b]	Flash Fire
New Crude Tanks	1,600 Btu/(hr·ft^2)	340	DNCE	Pool Fire*
Wilmington Operations				
FCCU	Hazards eliminated due to unit shutdown			
HTU-1/2	LFL	1170	1065	Flash Fire
HTU-4	Modifications do not affect hazard zone			
CRU-3	30 ppm	1595	2190	Toxic (H_2S)
PSTU	30 ppm	1085	2190[c]	Toxic (H_2S)
HCU	LFL	1320	1450	Flash Fire
SARP	3 ppm	1905	DNCE	Toxic (SO_2)*
Replace Crude Tanks	1,600 Btu/(hr·ft^2)	265	190	Pool Fire
Other				
Interconnecting Pipelines	LFL	380	DNCE	Flash Fire*
LPG Rail Car Unloading	1.0 psig	1,700	1,700	BLEVE

(a) See Appendix C for further details on the maximum credible events.
(b) DNCE: The hazard does not currently exist.
(c) Existing hazard in the CRU3.
* Potentially Significant Hazard Impact

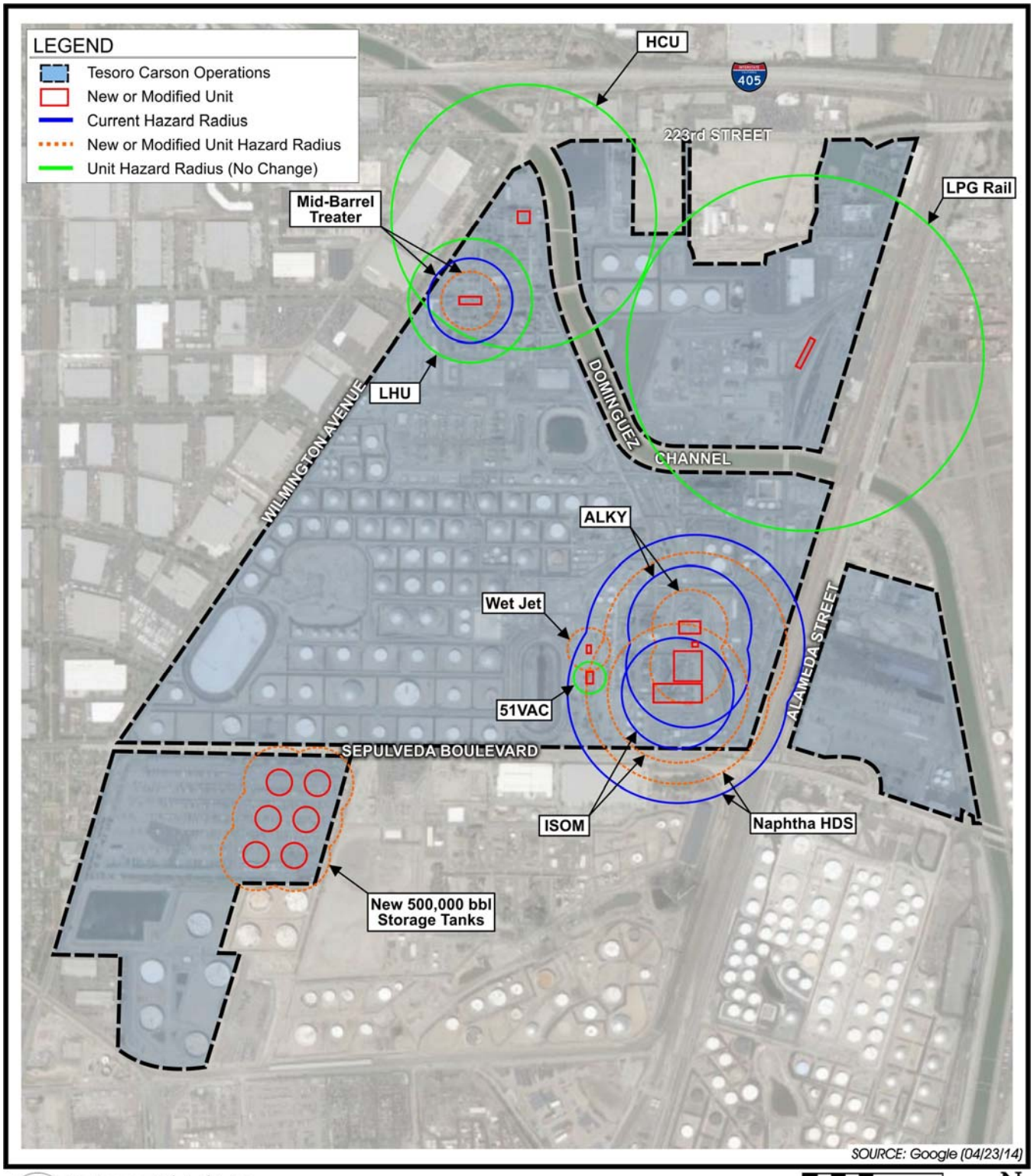

FIGURE 4.3-1
CARSON OPERATIONS VULNERABILITY ZONES
TESORO LOS ANGELES REFINERY

Project No. 2844

N:\2844\Hazards\Hazards (Carson, rev.3).cdr

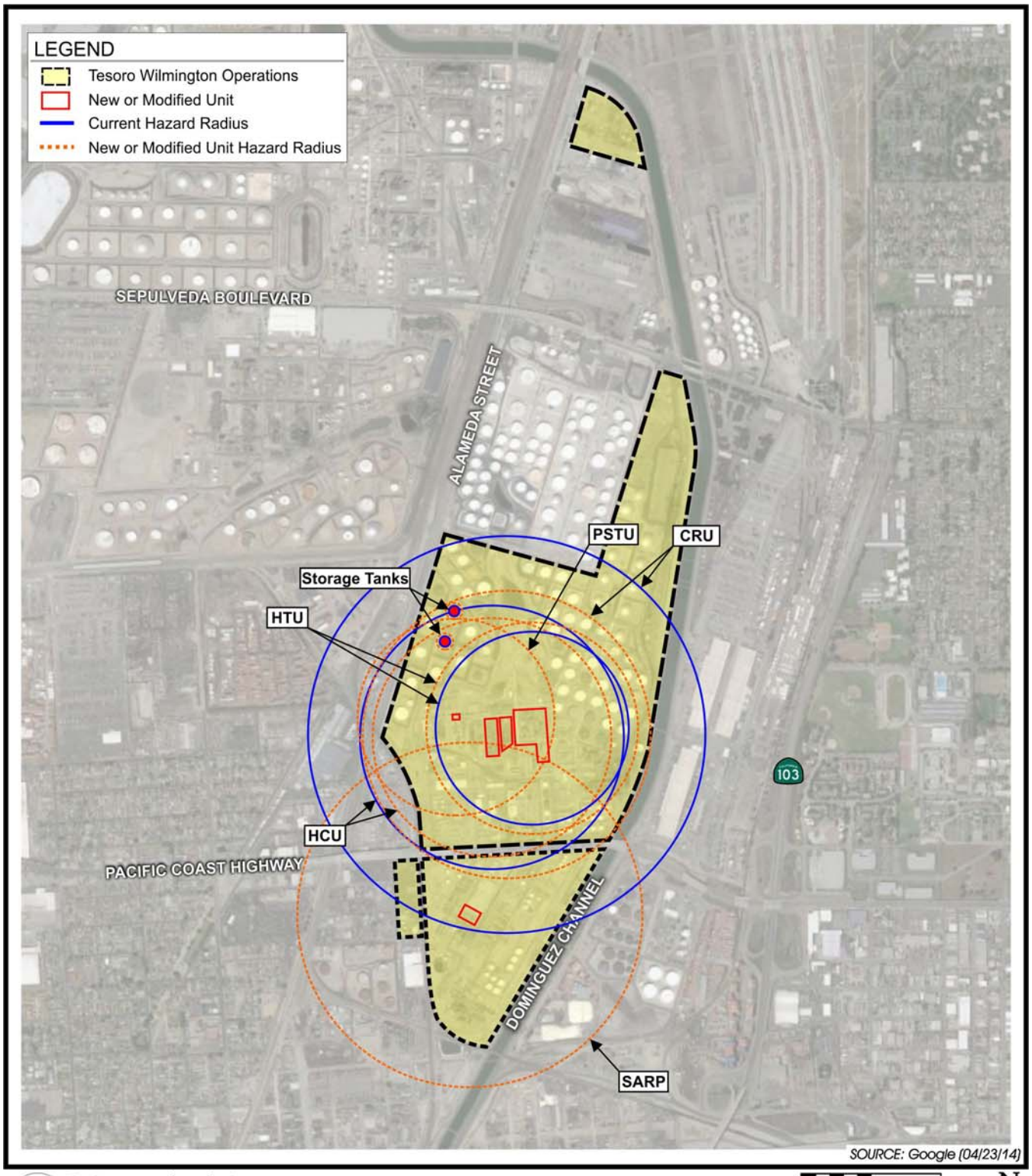

FIGURE 4.3-2
WILMINGTON OPERATIONS VULNERABILITY ZONES
TESORO LOS ANGELES REFINERY

Project No. 2844
N:\2844\Hazards\Hazards (Wilmington, rev.2).cdr

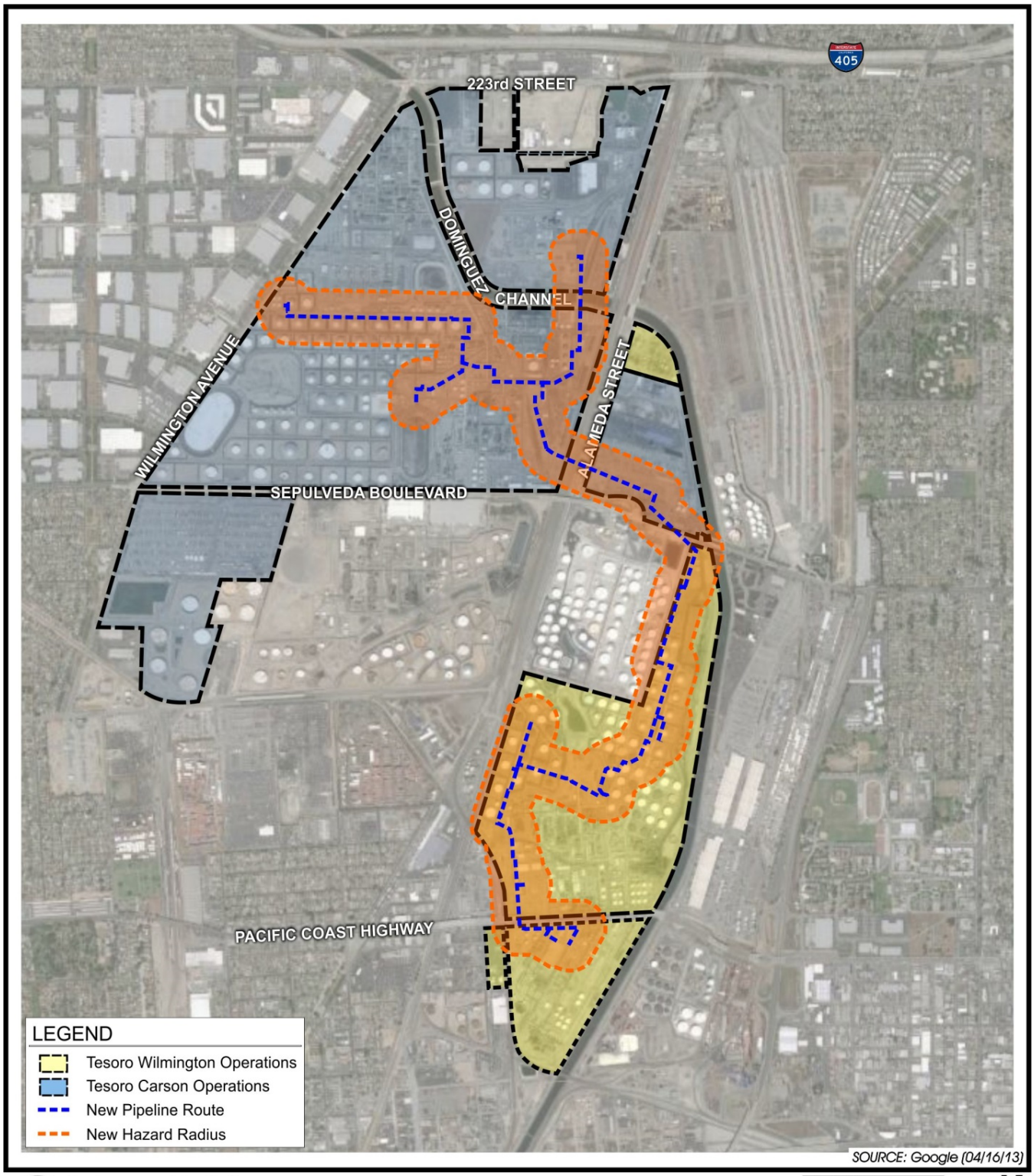

FIGURE 4.3-3
PIPELINE OPERATIONS VULNERABILITY ZONES
TESORO LOS ANGELES REFINERY

Project No. 2844
N:\2844\Hazards\Hazards (Pipeline).cdr

Figures 4.3-1 and 4.3-2 identify existing and future maximum hazard zones once the proposed project becomes operational and the off-site areas where the applicable significance thresholds would be potentially exceeded in the event of an accidental upset exposure. The project components that have the potential to generate significant adverse hazard impacts are those that have the potential to result in new off-site exposures to members of the public (i.e., residents, off-site workers, or general public). The new and modified units that have the potential to create a new off-site hazard or extend an existing hazard further off-site to non-residential off-site workers include the Naphtha Isomerization Unit and new crude tanks at the Carson Operations, and the SARP at the Wilmington Operations. The hazards associated with the Interconnecting Pipelines would also extend off-site to non-residential off-site workers as portions of the pipeline are located off-site (see Figure 4.3-3). The hazards associated with the Naphtha Isomerization Unit, new crude tanks, and Interconnecting Pipelines would adversely impact the roadways adjacent to the Refinery (see Figures 4.3-1 and 4.3-2) or other industrial areas (e.g., other refineries, railyards) resulting in new significant hazard exposure to non-residential off-site workers in the event of an accidental release. The hazards associated with the SARP are potentially significant in the event of a worst-case accidental release of sulfur dioxide and could extend up to about 1,905 feet. Although the projected hazard zone would avoid residential areas, several houses are located within nearby industrial areas where the projected sulfur dioxide hazard zone (sulfur dioxide concentrations would exceed the three ppm significance threshold). Tesoro has chosen the optimal location for the SARP, both from an operational standpoint as well as to limit any hazard impacts. The SARP regenerates spent acid from the Alkylation Units; therefore, the optimal location of the SARP is adjacent to the Alkylation Unit at either Carson or Wilmington Operations. This will limit additional potential hazards associated with longer acid piping runs through the Refinery. There is no plot space available near the Carson Operations Alkylation Unit for the SARP, however there is sufficient plot space next to the Wilmington Operations Alkylation Unit. The Wilmington Operations Alkylation Unit is also adjacent to the Wilmington Operations Boiler House. Locating the SARP by the Wilmington Operations Alkylation Unit and Boiler House ensures availability of necessary utilities for the SARP operations. As a result, the proposed project has the potential to create significant adverse hazard impacts to residents in the event of a worst-case accidental release. Therefore, the hazard impacts associated with the proposed project are concluded to be potentially significant. The details of the analysis are included in Appendix C.

The above hazards analysis takes a worst-case approach by assuming that the entire contents of a tank or other equipment would rapidly be released and that no safety measures are implemented that could reduce the severity of an accidental release. It should be noted that existing maintenance inspections and extensive safety measures and training would likely reduce the probability and severity of a catastrophic or hazardous event. In addition, in 2012 subsequent to the Chevron Richmond Refinery fire, the Governor formed an Interagency Working Group to improve public and worker safety state-wide to minimize events and improve interagency coordination of response activities during an event (Interagency Working Group on Refinery Safety, 2014). Based on the analysis of potential hazard impacts, which uses worst-case assumptions, the consequences of a hazardous materials release would be the same irrespective of the cause of the release (e.g., human error, equipment failure, sabotage, terrorism, natural disaster, or civil uprising). Since operation of the proposed project will not introduce the use of new flammable substances or hazardous materials that are not currently used at the Refinery, no

new sources of accidental releases of new hazardous materials would be present at the Refinery. The proposed project includes modifications to existing units and new units that will be connected to vapor recovery and safety flare systems. Additional flaring from normal operations is prohibited by Rule 1118. The project is not expected to increase flaring at the Refinery. There will be no routine vents to the flare system or the flare gas recovery systems from any of the modifications. While the number of pressure relief valves tied in to the flare systems will increase with installation of new or modified process units, this will not cause an increase in flaring. There will however, be additional potential vent sources to the flare gas recovery and flare systems during unit upsets or emergencies.

Secondary effects, such as ash fallout from a fire, may occur as a result of a potential hazard. These effects are incident specific and would vary depending on the type of hazard, chemicals involved, and ambient conditions at the time of the incident. Therefore, these secondary effects are considered speculative and are not analyzed.

4.3.2.2 Regulatory Compliance

The proposed project modifications must comply with various regulations, including state and federal OSHA regulations, as well as regulations that regulate the handling of toxic, flammable, reactive, and explosive materials, as discussed below.

The proposed project will make modifications to existing Operations that are expected to be adequately served by the existing fire-fighting capabilities. Section 3.3.6 describes the existing fire-fighting capabilities. New tanks will be equipped with fixed foam systems in compliance with current regulations.

Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 7401 et. Seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop RMPs to prevent accidental releases of these substances. The Refinery has prepared an RMP for the existing Refinery which may need to be revised to incorporate the changes associated with the proposed project.

Under federal OSHA, regulations have been promulgated that require the preparation and implementation of a Process Safety Management (PSM) Program (29 CFR Part 1910, Section 119, and Title 8 of the California Code of Regulations, Section 5189). A PSM Program that meets the requirements of the regulations will prevent or minimize the consequences of a release involving a toxic, reactive, flammable, or explosive chemical and their potential impacts on workers and the surrounding community. A PSM review for the new and modified equipment would be required as part of the proposed project. The primary components of a PSM include the following:

- Compilation of written process safety information to enable the employer and employees to identify and understand the hazards posed by the process;
- Performance of a process safety analysis to determine and evaluate the hazard of the process being analyzed;

- Development of operating procedures that provide clear instructions for safely conducting activities involved in each process identified for analysis;
- Training in the overview of the process and in the operating procedures for facility personnel and contractors. The training would emphasize the specific safety and health hazards, procedures, and safe practices; and,
- A pre-start up safety review for new facilities and for modified facilities where a change is made in the process safety information.

The Refinery will comply with all the above-listed regulations, conform to National Fire Protection Association standards, and to any other applicable safety regulations such as the federal Hazardous Material Transportation Act, which regulates transportation of hazardous materials. For a comprehensive discussion of other potentially applicable federal, state, and local hazardous materials regulations the Refinery may need to comply with, see Section 3.3.6 of this EIR. Therefore, no significant adverse regulatory compliance impacts are expected.

4.3.2.3 Pipeline Hazards

Pipeline Rupture/Fires: The new Interconnecting Pipelines bundle will contain multiple pipelines that are expected to transport gasoline and gasoline blending components, gas oil, crude oil, butylene, propylene, and LPG between the Carson and Wilmington Operations, thus, achieving the project objective of further integrating the operations into one Refinery. As discussed in Section 4.3.2.1, the potential worst-case hazard associated with the new Interconnecting Pipelines would be a flash fire from an above ground pipeline that could extend up to approximately 380 feet (see Table 4.3-2 and Figure 4.3-3). Land use in the vicinity of the Interconnecting Pipelines is heavy industrial and most of the new Interconnecting Pipelines would be within the confines of the Refinery, except where it crosses under Sepulveda Boulevard and Alameda Street. The closest residential land uses to the proposed new pipelines would be approximately one-half mile away (residential area east of the Refinery in Long Beach). The maximum hazard zone for any of the pipelines would be 380 feet and would not extend to the residential areas. It should also be noted that existing pipelines are located in the same corridor as the proposed pipelines and have existing hazards of approximately the same magnitude as the proposed pipelines as the existing pipelines convey similar materials at similar operating temperatures and pressures. Therefore, the largest potential hazards associated with the proposed pipelines are essentially the same as existing pipelines.

The proposed Interconnecting Pipelines associated with the proposed project would be underground off-site (i.e., approximately 80 feet under Alameda Street and Sepulveda Boulevard). Therefore, the potential for a fire in the off-site pipelines would be unlikely due to the depth of the pipeline and the lack of air needed to initiate combustion. In addition, the proposed Interconnecting Pipelines will include heavy-wall pipe with extra corrosion allowance, cathodic protection installed on all lines, and all lines will have a fusion bond epoxy coating with abrasion resistant coating. Further, because the proposed project does not include making any equipment modifications (such as, change in metallurgy in the crude units) that would allow the Refinery to receive crude oils that cannot be blended to the same API gravity, sulfur content and other parameters such as TAN that it currently receives, the proposed project is not expected to

result in pipeline transport of petroleum products with a higher corrosivity than is currently transported by the Refinery through existing pipelines (see Subsection 2.5.4.2 for additional information on crude oil blends that can be received by the Refinery). Isolation valves will be installed on both ends of the lines with flow meters to monitor for flow discrepancies and activate isolation valves if necessary. Equipment that would allow early detection of anomalies in the lines would also be included as part of the interconnecting pipeline. Therefore, an underground pipeline failure of one pipeline is not expected to contribute to a failure of another pipeline.

For the above ground portions of the Interconnecting Pipelines, a fire involving one pipeline could radiate heat to other adjacent above-ground pipelines that are near the pipeline that is producing the fire. Refinery equipment and piping is designed using stringent design codes. For the facility process piping, it is American Society of Mechanical Engineers (ASME) B31.3. While not specifically designed for an external fire, under this code, piping is designed to withstand various design temperatures and pressures and has safety factors such as corrosion allowance that give it additional strength. The melting point for the carbon steel material used per B31.3 is approximately 2600 deg F. If the adjacent pipelines are operating, heat would be transferred to the product in the pipeline, but the heat would dissipate as the product travels through the pipeline away from the vicinity of the fire, reducing the potential for a release from another pipeline failure. If the adjacent pipeline was not operating, there would be no product in the pipeline so that an accidental release in the adjacent pipeline could not occur. The pipelines that would be above ground would be limited to the Refinery property and fires impacts would be limited to the Refinery property. Therefore, the potential hazard impacts associated with the proposed Interconnecting Pipelines are expected to occur primarily on the Refinery properties or off-site industrial areas immediately adjacent to those pipelines (see Figure 4.3-3).

Pipeline Releases: In addition to flash fires, hazards associated with pipelines could include accidental releases of the material that they transport (e.g., gasoline blending components, gas oil, crude oil, butylene, propylene and LPG) to the environment. In the event that the pipeline leak is not detected promptly, potential impacts associated with a pipeline leak would generally be contamination of the local soils and, depending on the geology of the accident site, potential contamination of local ground water (see Subsection 4.3.2.4). Because comprehensive corrosion protection and leak detection measures required by the Department of Transportation (DOT) (see Pipeline Regulations below) would be required and are included as part of proposed Interconnecting Pipelines, the potential for a leak to go undetected is expected to be minimal. As explained below, a number of laws, rules, and regulations are in place that apply to both new and existing pipelines that minimize the potential for accidental pipeline releases. As explained in the following paragraphs, the proposed project will comply with all applicable pipeline regulations.

Pipeline Regulations: The U.S. DOT Pipeline and Hazardous Materials Safety Administration (PHMSA) compiles pipeline incidents statistics, which identify the major causes of leakage or rupture including: (1) corrosion; (2) third party excavation; (3) damage by natural events (e.g., a seismic event); and, (4) equipment failure. New pipelines are less likely to leak or rupture than old pipelines due to increased regulatory requirements such as use of state-of-the-art in-field inspection techniques and corrosion protection as explained in the following paragraphs.

New pipelines are subject to comprehensive regulation including requirements for pre-operational testing to ensure the operational integrity of the pipeline. (See the discussion of regulatory standards in Section 3.3.7.1.5.) Hydrostatic testing to 125 percent of the operating pressure is required by the State Fire Marshal prior to operation of a pipeline. Additional periodic testing is required for pipelines, with the frequency of testing based on pipeline age, use of cathodic protection, and release history. New pipelines are required to accommodate instrumented internal inspection devices (commonly referred to as "smart pigs"). "Smart pigs" detect where corrosion or other damage has affected the wall thickness or shape. Additionally, to ensure the pipeline is operating properly and the total volume of material shipped is received, monitoring of operations during transfer of material is required and may include pressure indicators along the pipeline route, as well as flow meters at both the shipping and receiving ends of the pipeline. Underground interconnecting piping that will be installed between Wilmington and Carson Operations will employ state of the art corrosion control and leak detection equipment that meets the requirements of the DOT and recommended engineering practices. Leak prevention measures include cathodic protection and corrosion-resistant coatings and/or wrappings for corrosion control. Leak detection measures include flow meters accurate to 0.1% for lines 6" and smaller and 0.15% for the 10" and 12" lines along with automatic isolation valves at both ends of the underground interconnecting pipelines. If flow measurements from the dual meters for any line vary above a specified threshold, transfer pumps will be shut down and the automatic isolation valves will be activated, as appropriate. The line will not be returned to service until the discrepancy is resolved. Management and monitoring systems associated with pipelines allow the rapid identification of a release and immediate shutdown of the pipeline to minimize the impact of a release. Tesoro operators will comply with all applicable regulations, testing, and monitoring requirements. Implementation of these requirements is expected to minimize the probability and severity of potential hazard impacts of any pipeline leaks, should they occur.

A number of federal, state, and local laws have been enacted to regulate the use, storage, transportation, and management of hazardous materials and wastes. Section 3.3.6.1.5 outlines pertinent regulations and agency oversight that direct the use, handling, transportation, storage, and remediation of hazardous materials and wastes, including petroleum products. The Tesoro Los Angeles Refinery complies with these regulations and has numerous programs to ensure its continued compliance with environmental, safety and health requirements. Compliance with such regulations is expected to reduce the frequency and consequences of events resulting in hazardous releases. Although the regulatory requirements imposed on the proposed project pipelines minimize the potential for hazard impacts, the potential adverse off-site pipeline hazard impacts remain and are considered potentially significant.

4.3.2.4 Impacts on Water Quality

An accidental spill of any of the hazardous materials associated with the proposed project (generally petroleum products and by-products from the refining process) used and stored at the Refinery could occur under upset conditions, e.g., earthquake, tank rupture, and tank overflow. Accidental spills or leaks also could occur from undetected corrosion of containers, piping and process equipment, and leaks from seals or gaskets at pumps and flanges. A major earthquake

would be a potential cause of a large spill or release. Other causes could include human or mechanical error.

The probability of leaks occurring from the underground Interconnecting Pipelines bundle is low because comprehensive corrosion protection and leak detection measures would be required and are included as part of proposed interconnecting pipeline (see Subsection 4.3.2.3). Further, management and monitoring systems associated with pipelines allow the rapid identification of a release and immediate shutdown of the pipeline to minimize the impact of a release. Therefore, the probability of a leak of hazardous materials from the Interconnecting Pipelines bundle that could adversely affect groundwater is considered to be low.

The Refinery must obtain building permits prior to construction activities. During the issuance of building permits, the Refinery must demonstrate to the local agency (either the City of Los Angeles or Carson) that construction of the vessels and foundations would be in accordance with the California Building Code requirements. Compliance with the California Building Code helps structures to resist major earthquakes without collapse, but could result in some structural and non-structural damage following a major earthquake. Further, the Refinery performs foundation inspections after major earthquakes and makes any necessary repairs. Foundation inspections would continue to occur after major earthquakes once the proposed project becomes operational.

Spills at the Refinery facilities would generally be collected within containment facilities for storage tanks and loading and unloading equipment, including the equipment modified as part of the proposed project. The Refinery has emergency spill containment equipment and would implement spill control measures in the event of an accidental release of hazardous caused, for example, by human error, equipment failure, sabotage, terrorism, natural disaster (e.g., earthquake), or civil uprising. Storage tanks and loading and unloading equipment have secondary containment capable of containing 110 percent of the contents of the storage tanks. Therefore, the rupture of a tank would be collected within the containment system and pumped to an appropriate storage tank as soon as possible. Containment facilities would be required for new equipment.

No surface water runoff occurs from the Refinery site. Therefore, large spills outside of containment areas at the Refinery are expected to be captured by the Refinery grading and drainage system, where it would be controlled. Spilled material would be collected and pumped to an appropriate tank, or sent off-site if the materials cannot be used on-site. Because of the containment and drainage systems, spills are not expected to migrate from the facility off-site or in to any water systems; therefore, potential adverse water quality hazard impacts are considered to be less than significant.

4.3.2.5 Transportation Hazards

The transportation of hazardous materials can result in off-site releases through accidents or equipment failure. The materials currently transported to and from the Refinery include crude oil, gas oil, gasoline, diesel, LPG, sulfur, oxygen, fresh and spent sulfuric acid, fresh and spent caustic, and ammonia.

The transportation of hazardous substances poses a potential for fires, explosions, and other hazardous materials releases. In general, the greater the miles traveled, the greater the potential for a release during transport of hazardous substances. Statistical accident frequency varies, and is related to the relative accident potential for the travel route since some routes of travel are safer than others. The size of a potential release is related to the maximum volume of a hazardous substance that can be released in a single accident, should an accident occur, and the type of failure of the containment structure, e.g., rupture, leak, or BLEVE. The potential consequences of the accident are related to the size of the release, the population density at the location of the accident, the specific release scenario, the physical and chemical properties of the hazardous material, and the local meteorological conditions.

The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality.

Every time hazardous materials are moved from the site of generation, there are opportunities for accidental (unintentional) releases. The U.S. DOT conducted a study on the comparative risks of hazardous materials and non-hazardous materials truck shipment accidents (i.e., involved in a collision) and incidents (i.e., not involved in a collision). The Federal Motor Carrier Safety Administration (FMCSA) compared risks of hazardous materials truck shipment accidents and incidents to non-hazardous materials truck shipment accidents and incidents (FMCSA, 2001). The estimated accident rate for trucks (shipping non-hazardous materials) was 0.73 per million miles traveled. The average accident rate for trucks transporting hazardous materials (all hazard classes) was estimated to be 0.32 per million miles traveled (FMCSA, 2001). Since not all hazardous materials transport accidents involve releases, the average accident rate for trucks carrying corrosive materials involving a release (hazard class 8), such as sulfuric acid or fresh/spent caustic, was estimated to be 0.04 per million miles traveled (73/1,900,000,000) (FMCSA, 2001). A similar analysis of rail transport based on data from the U.S. DOT Bureau of Transportation Statistics (BTS, 2015) and the Pipeline and Hazardous Materials Safety Administration (PHMSA, 2015) estimates an average serious Hazard Material Information System (HMIS) incident rate of 0.08 per million miles traveled (17/221,820,000) for spent caustic and 0.03 per million miles traveled (9/331,090,000) for LPG. The accidents and incident rates are inclusive of all hazard situation (fire, explosion, release, BLEVE, etc.) that may occur, therefore, covers the risks scenarios ranging from small leaks to fatalities.

4.3.2.5.1 Truck Transport

The proposed project would result in a decrease in the transportation of spent sulfuric acid. Currently, spent sulfuric acid from the Carson Alkylation Unit is transported via pipeline to the ECO Services Dominguez Carson facility (located at 20720 South Wilmington Avenue, Carson, California, approximately one mile north of the Carson Operations) for recycling. Following completion of the SARP, spent sulfuric acid would be transported via truck to the SARP at the Wilmington Operations, a distance of about 1.9 miles. Spent sulfuric acid from the Wilmington Alkylation Unit is currently transported via truck to the ECO Services Dominguez Carson facility for recycling, a distance of approximately 5.55 miles. Following completion of the

SARP, spent sulfuric acid from Wilmington Operations would be treated on-site so that the transportation of spent sulfuric acid from Wilmington Operations would be eliminated. As shown in Table 4.3-3, the proposed project is expected to result in a decrease in the number of total vehicle miles traveled to transport spent acid, reducing overall truck transport and the related hazards. Therefore, the potential hazards associated with transporting sulfuric acid are considered to be less than significant.

TABLE 4.3-3

Proposed Project Impacts on Sulfuric Acid Transport

Parameter	Baseline 2012/2013 Average	Estimated Use Proposed Project
Wilmington Operations		
Spent Acid Generated (tons/yr)	52,984	52,984
Trucks to transport of Spent Acid (trucks/yr)[(a)]	2,119	2,119
Distance from Wilmington to the ECO Services Dominguez (miles)	5.55	NA
Total Truck Transport of Spent Acid (miles/yr)	11,762	0
Carson Operations		
Spent Acid Generated (tons/yr)	70,353	70,353
Trucks to transport of Spent Acid (trucks/yr)	2,814	2,814
Distance from Carson to Wilmington Operations(miles)[(b)]	NA	1.92
Total Truck Transport of Spent Acid (miles/yr)	0	5,403
Refinery Post Project Estimates		
Truck Transport of Spent Acid Post Project (Proposed Project –Baseline) (miles/yr)		-6,359

(a) Truck capacity is approximately 25 tons of acid per truck.
(b) 1.92 miles

The proposed project is expected to increase the shipment of caustic by truck. Fresh and spent caustic is currently shipped to the Refinery via truck. The Refinery currently uses over two million gallons (50,000 barrels) of caustic per year in various Refinery processes and transports approximately 300,000 gallons (7,000 barrels) of spent caustic per year. Spent caustic is first transported via truck to the Ventura Trucking facility (located just east of the Tesoro administration building on 223rd Street) where it is loaded onto rail for transport to the Gulf Coast for regeneration. The remaining spent caustic is recycled or processed internally in the Refinery and then discharged with treated wastewater.

The proposed project will result in an increase in the transport of fresh caustic of up to three trucks per day to the Carson Operations and the Wilmington Operations. Caustic will be used primarily in the Wet Jet Treater at Carson and also in air pollution control equipment (wet gas scrubber) proposed at the SARP at the Wilmington Operations. The proposed project is expected to generate approximately 110,880 gallons (2,640 barrels) of spent caustic per week so that approximately 10 truck trips per week will be required with up to three truck trips per day of five miles each. Trucks will transport spent caustic from the Wet Jet Treater and SARP units to

the Ventura Trucking facility. The spent caustic transported to the Ventura Trucking facility will be loaded onto railcars for transport to the Gulf Coast for regeneration.

As discussed above, the fresh and spent caustic trucks from the proposed project are expected to deliver the caustic materials locally, and travel a maximum of 45 miles per day (over 6 deliveries). Using the maximum estimated truck trips of 45 miles per day, the potential for an accident involving a caustic truck is 0.000002 (45 miles per day / 1 million miles x 0.04 accidents/million miles driven) or approximately one accident every 555,556 years. Though it is difficult to compare hazardous and non-hazardous transport risk, the differences appear to be significant enough to conclude that the number of non-hazardous transport accidents dominates highway transport risk. The specific hazardous material trucking regulations and additional care provided by carriers and shippers of hazardous materials appear to be reducing the accident rate for hazardous material shipments (FMCSA, 2001).

The County of Los Angeles has developed criteria to determine the safest transportation routes. Some of the factors which need to be considered when determining the safest direct routes include traffic volume, vehicle type, road capacity, pavement conditions, emergency response capabilities, spill records, adjacent land use, and population density. In managing the risk involved in the transportation of hazardous materials, all these factors must be considered.

The actual occurrence of an accidental release of a hazardous material associated with a traffic accident cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and residential areas into account. Because spent caustic is currently transported by truck, the consequences of an accidental release would not change. The likelihood that an accident involving a hazardous truck transport would occur is once every 555,556 years. Therefore, the probability for an adverse impact from truck transport of hazardous materials is extremely low and the potential hazard impact related to truck transport from the proposed project is less than significant.

4.3.2.5.2 Rail Transport

The proposed project is expected to increase the shipment of caustic by rail using rail cars specifically designed for the transport of caustic. As previously discussed, the proposed project is expected to generate approximately 110,880 gallons (2,640 barrels) of spent caustic per week. The spent caustic will be transported to the Ventura Trucking facility by truck before it will be loaded onto railcars for transport to the Gulf Coast for regeneration. Therefore, the proposed project will add about four railcars per week of spent caustic acid to existing trains that are currently transporting spent caustic from the Refinery. Using the maximum estimated travel to the state line of 277 miles per railcar for four railcars, the potential for a serious HMIS incident involving a caustic railcar is 0.00007 (1110 miles per day / 1 million miles x 0.08 accidents/million railcar miles) or approximately one accident every 11,760 years.

The proposed project is also expected to increase the number of LPG railcars by a maximum of 10 per day. The LPG will be transported in railcars specifically designed to transport LPG and stored within existing storage tanks at the Carson and Wilmington Operations. LPG can originate from a number of locations including Northern and Central California; Lynndyl, Utah; Bumstead, Arizona; and Hutchinson or Conway, Kansas. The longest route within California starts in Martinez and arrives at the Refinery via Barstow, and is approximately 605 miles. These additional LPG railcars will be added to existing rail shipments. Using the maximum estimated trips travel of 605 miles per day per railcar for 10 railcars, the potential for a serious HMIS incident involving a LPG railcar is 0.0002 (6,050 miles per day / 1 million railcar miles x 0.03 accidents/million miles) or approximately one accident every 6,081 years.

The likelihood that an accident involving a hazardous rail transport would occur is once every 11,760 years for spent caustic and 6,050 years for LPG. Because spent caustic and LPG are currently transported by rail, the consequences of an accidental release of either material would not change. Therefore, the probability for an adverse impact from rail transport of hazardous materials is extremely low and the potential hazard impact related to rail transport from the proposed project is less than significant.

The existing hazards associated with loading/unloading LPG are shown on Figure 4.3-1. The proposed project would not introduce any additional hazards associated with the loading/unloading of LPG as there would be no modifications to the existing storage facilities or loading and unloading facilities; there would only be an increased throughput of LPG through the existing facilities. Therefore, the proposed project would not change the magnitude of the existing hazard zone shown in Figure 4.3-1 because all of the equipment associated with rail loading, delivery, and storage would remain unchanged.

4.3.2.6 Hazard Impacts During Construction

The Carson Operations and Wilmington Operations are known to have groundwater and soil contamination that have been and will continue to be remediated and managed under RWQCB oversight. Extensive soil and groundwater investigations have been conducted at the site with the oversight of the RWQCB as discussed in Subsections 3.3.4.1 and 3.3.4.2 in Chapter 3 of this EIR.

The construction phase of the proposed project will require construction workers to excavate soil across the Wilmington Operations, the southeastern portion of the Carson Operations, and the Carson Crude Terminal, where construction of the new crude storage tanks will occur. Therefore, construction workers could encounter contaminated soils and groundwater during site excavation. Generally, a hazards analysis focuses on impacts to off-site receptors because they are unlikely to have undergone safety training or have safety equipment available in the event of a hazard event. On-site workers are provided with protection against many types of hazard impacts as a result of having access to safety equipment, participating in safety exercises, and undergoing profession training to safely work around the potentially hazardous conditions that exist within a refinery. Further, extensive rules, regulations, laws, and other requirements are in place, specifically designed to ensure a safe working environment for industrial workers, including refinery workers and construction workers. The following analysis of potential hazard

impacts during construction identifies potential hazards during construction and whether such hazards could pose significant risks to off-site receptors. Effects of any construction hazards identified will also be evaluated for construction workers.

All excavated soil will be handled per Tesoro's Los Angeles Refinery Management Plan for Excavated Soil. This plan details Tesoro's process for soil handling, excavation planning and soil management, and compliance with SCAQMD's Rule 1166 VOC Monitoring and fugitive-dust controls. The Management Plan for Excavated Soil will be followed prior to and during the excavation of soil within the Tesoro Wilmington and Carson Operations property boundaries, consistent with any Tesoro excavation projects. Existing site characterization data showing contaminated soil sites will be supplemented with sample data from pre-project exploratory borings conducted throughout the construction zone to develop a project-specific Soil Management Plan.

As part of the design of the proposed project, soil samples have been collected in areas of the Refinery where construction is to take place to characterize the soil for disposal purposes (i.e., hazardous or non-hazardous waste designation) and to provide data to assess the potential of exposure to contaminated soil and groundwater (Trihydro, 2015). The samples indicate that of soil to be potentially excavated, with the exception of soil in the location of the six new crude tanks, approximately 95 percent of the excavated soil will be classified as non-hazardous waste (see Table 4.6-1, which shows the total volume of soil excavated and the volumes of the total that would be classified pursuant to 40 CFR 260 and 22 CCR Title 9 as hazardous or non-hazardous wastes). During the soil sampling activities, air sampling consistent with SCAQMD Rule 1166 guidance was performed. The air sampling results indicate that in areas within the Refinery where excavation is expected to be less than 20 feet, VOC concentrations are expected to be less than the 50 ppm limit that requires special soil handling procedures to be implemented, with the exception of two areas. Two areas have the potential for shallow soil contamination with VOC concentrations in excess of the Rule 1166 50 ppm limit.

The first exception area where air samples exceeded 50 ppm is a portion of the area where the six new crude tanks are to be installed, which was the location of a former oil reservoir. The soil in this area is potentially impacted with heavy hydrocarbons with small concentrations of light hydrocarbons (e.g., benzene, toluene, ethylbenzene, xylenes) with the local depth to groundwater around 45 feet (ThermoRetec, 2001). The nearest resident to the proposed six new crude storage tanks is approximately 1,300 feet west of the Refinery. However, with low concentrations of light hydrocarbons, it is not expected that the Rule 1166 50 ppm limit will be exceeded at the nearest residential areas because the hydrocarbon gases will be substantially diluted as they travel 1,300 feet. Pursuant to applicable worker safety laws (which are outlined in the bullet points below) workers in this area will be required to wear personal protection equipment such as gloves, coveralls, boots, hard hats, etc. and if deemed necessary by monitoring, respiratory protection (see the discussion under Health and Safety Plans below). Workers will also be required to handle contaminated soil in accordance with a variety of safety procedures including the Resources Conservation and Recovery Act and Hazardous Waste Control Law (see the summary of those requirements in the bullet points below).

The second exception where air samples exceeded 50 ppm is the area along the pipeline route in the central portion of the Wilmington Operations. The Rule 1166 monitoring performed during soil sampling activities measured a 364.1 ppm concentration of VOC emissions, which exceeds the Rule 1166 50 ppm limit that requires special handling procedures. The monitoring showed that the potential to generate hydrocarbon emissions from soil excavation during construction is expected to be limited to the area along the pipeline route in the central portion of the Wilmington Operations. The nearest resident to the pipeline construction area in the central portion of the Wilmington Operations is approximately 2,000 feet to the west. It is expected that dilution of the hydrocarbon gases over distance will result in hydrocarbon concentrations much less than the Rule 1166 50 ppm limit at the nearest residential receptors. Construction workers that work in this area will be required to wear personal protection equipment such as respirators, gloves, coveralls, boots, hard hats, etc. (see the discussion under Health and Safety Plans below). Workers will also be required to handle contaminated soil in accordance with a variety of safety procedures including the Resources Conservation and Recovery Act and Hazardous Waste Control Law (see the summary of those requirements in the bullet points below).

The total depth of excavations necessary to install the foundations for the proposed project components are expected to be four feet deep with pilings drilled to approximately 30 feet. While groundwater is not expected to be encountered during excavations for foundations, it is possible that contaminated groundwater may be encountered during construction of pilings. Pilings would be required to support all new units and major pieces of equipment, e.g., Wet Jet Treater, SARP, and storage tanks. During the installation of pilings, if contaminated groundwater is encountered, it would be handled in accordance with Refinery operating procedures to collect the fluid in a sealed container and process the collected fluid in the on-site wastewater treatment plant. Construction workers that may encounter contaminated water are required by applicable laws to wear personal protection equipment such as respirators, gloves, coveralls, boots, hard hats, etc. (see the discussion under Health and Safety Plans below). Workers will also be required to handle contaminated soil in accordance with a variety of safety procedures including the Resources Conservation and Recovery Act and Hazardous Waste Control Law (see the summary of those requirements in the bullet points below).

Construction workers at the Refinery and other locations are protected by numerous existing rules, regulations and requirements and have been professionally trained to safely work around the potentially hazardous conditions that exist within a refinery. The Tesoro Refinery complies with existing laws and regulations that address the discovery and remediation of contaminated sites, including the discovery of such sites during construction activities. The Refinery complies with existing laws that require health and safety plans, worker training, and various other activities which serve to protect workers from exposure to contamination and are summarized below. Compliance with these laws will ensure that any off-site receptor or worker exposure is less than significant. The principle laws relative to worker safety are summarized in the following bullet points.

- **Hazardous Waste Operations and Emergency Response Standard (HAZWOPER, Fed-OSHA, 29 CFR 1910.120):** The HAZWOPER Standard applies to employees who are exposed or potentially exposed to hazardous substances, including hazardous waste, and who are engaged in clean-up operations. Facilities that use, store, manufacture,

handle, process, or move hazardous materials (including remediation operations) are required to conduct employee safety training, have available and know how to use safety equipment, prepare illness prevention programs, provide hazardous substance exposure warnings, prepare emergency response plans, and prepare a fire prevention plan (29 CFR Part 1910). In California, Cal-OSHA assumes primary responsibility for enforcing workplace safety regulations (Cal-OSHA, HAZWOPER, 8 CCR 5192).

- **Cal-OSHA:** Safety requirements to protect employees, including construction workers, from potential exposure to hazardous substances are enforced by Cal-OSHA in Title 8 of the CCR. Specifically, 8 CCR 5155 establishes permissible exposure levels (PELs) and short-term exposure levels (STELs) for various chemicals including petroleum hydrocarbons. These requirements apply to all construction and exposure, whether contamination is discovered as part of construction or from other activities such as direct chemical use. The PELs and STELs establish levels below which no adverse health effects are expected. These requirements protect the health and safety of the workers and, by limiting workplace concentrations, limits potential exposures to nearby populations, including sensitive receptors.

- **Health and Safety Plans (HASP):** HASPs are prepared on a site-specific basis for contaminated sites and are developed in accordance with guidelines set forth in 8 CCR 5192 and 29 CFR 1910.120. HASPs include a review of site specific hazards and evaluation of the potential for chemical inhalation, ingestion, and absorption hazards, as well as a review of physical hazards (heat, slips, trips, falls, and noise) at the site. HASPs outline the required monitoring at the site for chemical exposures, particulate/dust, noise, and other site-specific hazards. For example, photoionization detectors (PIDs) are often used to monitor for vapors in the worker's breathing zone. Readings above 75 ppm for more than one minute generally require the use of respirators with organic vapor cartridges. Additional controls and measures are required when higher vapor readings are detected, e.g., full-face respirators, removal of workers from the site, etc. The use of respiratory protection minimizes worker exposures in the event that high levels of contaminants are encountered. HASPs outline requirements for training workers engaged in field activities on the potential health and safety hazards associated with their job function, in compliance with the HAZWOPER (29 CFR 1910.120) and other applicable OSHA standards. Other general health and safety requirements included in HASPs and enforced at contaminated worksites include site safety meetings, the use of personal protective equipment (e.g., gloves, coveralls, boots, hard hats, etc.), decontamination procedures, disposal procedures, communication procedures, emergency procedures, and recordkeeping requirements.

- **SCAQMD Rule 1166, VOC Emissions from Decontamination of Soil:** Under the SCAQMD-approved Rule 1166 monitoring plan, routine monitoring is required during excavation to detect VOC contamination that exceeds 50 ppmv. For, example, Rule 1166 requires monitoring for VOC contamination at least once every 15 minutes commencing at the beginning of excavation or grading and record all VOC concentration readings of VOC contaminated soil and appropriate mitigation, if VOC contamination

exceeds 50 ppm. If contamination is discovered, the health and safety plan will be implemented that specifically requires the use of employees trained in hazardous material/waste procedures, personal protective clothing, and so forth that minimize employee exposure. These actions include the covering of the soil with tarps or other impermeable coverings. Actions to minimize employee exposure will also serve to reduce off-site exposures.

- **Resource Conservation and Recovery Act and Associated Hazardous and Solid Waste Amendments, 40 CFR 260:** RCRA created a major federal hazardous waste regulatory program that is administered by the U.S. EPA. The goal of RCRA, a federal statute passed in 1976, is the protection of human health and the environment, the reduction of waste, the conservation of energy and natural resources, and the elimination of the generation of hazardous waste as expeditiously as possible. The Hazardous and Solid Waste Amendments of 1984 significantly expanded the scope of RCRA by adding new corrective action requirements, land disposal restrictions, and technical requirements. The corresponding regulations in 40 CFR 260-299 provide the general framework for managing hazardous waste, including requirements for entities that generate, store, transport, treat, and dispose of hazardous waste. RCRA sets standards for transporters of hazardous waste. Hazardous waste removed from generating sites must be transported by licensed hazardous waste transporters. Transported materials must be accompanied by hazardous waste manifests. U.S. EPA approved California's program to implement federal hazardous waste regulations as of August 1, 1992.

- **Hazardous Waste Control Law (California Health and Safety Code, Chapter 6.5):** California's program to implement the federal RCRA requirements is referred to as the Hazardous Waste Control Law (HWCL) and administered by the Cal-EPA, DTSC. DTSC has adopted extensive regulations governing the generation, transportation, and disposal of hazardous wastes to implement the federal RCRA cradle-to-grave waste management system in California aimed at protecting human health and the environment. California hazardous waste regulations can be found in Title 22, CCR Division 4.5, Environmental Health Standards for the Management of Hazardous Wastes. The HWCL regulations establish requirements for identifying, packaging, and labeling hazardous wastes. They prescribe management practices for hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills. Hazardous waste is tracked from the point of generation to the point of disposal or treatment using hazardous waste manifests. The manifests list a description of the waste, its intended destination, and regulatory information about the waste. In addition, California regulates the transportation of hazardous waste originating or passing through the state (13 CCR Title 13).

As discussed in the CARB Air Quality and Land Use Handbook: A Community Health Perspective, health risk decreases rapidly with distance (e.g., for gasoline dispensing stations, which handle light hydrocarbons, health risks at 500 feet from the source are less than one in one million) (CARB, 2005). Therefore, as demonstrated in the analysis above, exposure to VOC

emissions from contaminated soil during construction activities by off-site residential receptors is expected to be less than significant because the distances to residential receptors is expected to be 1,000 to 2,000 feet from construction areas identified to have low concentrations of light hydrocarbons. Similarly, exposure to VOC emissions from contaminated groundwater during construction activities by off-site residential receptors, which are located no less than 1,000 feet from construction areas, is expected to be less than significant as well, because of the distance between construction activities and residential receptors.

The above analysis also demonstrates that existing laws, rules, and regulations that apply to the Refinery requiring safety equipment, professional safety training, etc., are expected to minimize worker exposure to VOC soil and groundwater contamination during construction. Further, if VOC contamination is encountered, monitoring and remediation required by existing laws, rules, and regulations would be expected to minimize the potential for worker exposure. Compliance with these laws will minimize the potential for worker exposure to less than significant. Finally, off-site exposure to hazardous levels of hydrocarbon emissions from contaminated soil and groundwater is not expected due to the existing laws, rules, and regulations that apply to the Refinery that minimize the potential for off-site exposure and the distance between the construction areas and the residential receptors. Therefore, on-site and off-site exposures to VOC contaminated soil and groundwater during construction activities for the proposed project are concluded to be less than significant.

4.3.2.7 Hazards Associated with the Increased H-100 Firing Rate and Increased Utilization

The project includes increasing the duty of H-100, the Wilmington Operations DCU fresh feed heater, and potentially an increase of crude capacity at the Refinery by up to 6,000 bbl/day or approximately two percent. The increased use of the heater will also enable more efficient production of gas oil and distillates from the charge to the DCU. In addition, the proposed project could result in changes to the operation of some existing tanks and heaters. Although no physical modifications will be made, the following units will experience increased utilization as a result of this project:

- Carson Storage Tanks 14 (gas oil), 31 (gasoline), 62 (gasoline), 63 (gasoline), 64 (gasoline), 502 (gas oil), and 959 (gas oil).
- Wilmington Storage Tanks 80074 (distillate), 80211 (gasoline blendstocks), 80215 (gasoline blendstocks) and 80217 (gasoline blendstocks).
- Carson Heaters Hydrocracker R-1, Hydrocracker R-2 and the Light Hydrotreating Unit Heater.
- Wilmington DCU Heater H-101.
- Wilmington Hydrotreater Unit #3 Heaters H-30 and H-21/22.

- Wilmington Catalytic Reforming Unit Heaters H-510, H-501A, H-501B, H-502, H-503/504.
- Wilmington Steam Generating Boilers 7, 8, 9 and 10.
- Sulfur Recovery Plant Boilers H-1601/1602.
- Sulfur Recovery Plant Incinerators F-704 and F-754.

No physical modifications or changes to existing SCAQMD permits will be made to any of the storage tanks at the Carson Operations (Tanks 14, 31, 62, 63, 64, 502 and 959) or Wilmington Operations (Tanks 80074, 80211, 80215 and 80217) so there will be no change in the capacity or type of product that could be stored in each tank. However, there may be an increased utilization (throughput), within existing limits and capacity associated with the operation of these tanks. Because there is no change in the maximum storage capacity or type of commodity stored in the tanks, there would be no change in the hazard zones or hazard impacts associated with these tanks. Increasing the throughput by approximately two percent is not expected to appreciably affect the probability of a hazardous event occurring.

The proposed project could also result in increased utilization for the heaters, boilers and Sulfur Recovery Plant Incinerators identified above. The proposed project may result in an increased use of the heater, boiler or incinerators (within existing permit limits) but would not require any physical modifications. Since there would be no physical modifications, there would be no change in the hazards associated with these combustion sources (heaters, boilers and Sulfur Recovery Plant Incinerators).

4.3.3 MITIGATION MEASURES

Mitigation measures are required, if feasible, to minimize the potentially significant "worst-case" off-site hazard impacts associated with the proposed modifications to the Naphtha Isomerization Unit, the proposed new crude tanks, SARP, and Interconnecting Pipelines (see Table 4.3-2). As discussed in Section 3.3.7 and Subsection 4.3.2.2, there are a number of rules, regulations, and laws governing the Refinery operations that will minimize the potential adverse impacts associated with hazards at the facility and which would minimize the hazards associated with the Naphtha Isomerization Unit, new crude storage tanks, SARP, and Interconnecting Pipelines. Under federal OSHA, regulations have been promulgated that require the preparation and implementation of a PSM Program (40 CFR Part 1910, Section 119, and Title 8, CCR, Section 5189). A PSM that meets the requirements of the regulations will minimize the consequences of a release involving a toxic, reactive, flammable, or explosive chemical. Only one feasible mitigation measures has been identified, over and above the extensive safety regulations that currently apply to the Tesoro Refinery.

Regulatory requirements have varying implementation requirements. For example, CalARP requires updates be made within six months of a change, while PSM regulations require Pre-Start Up Safety Review for new facilities and for modified facilities if the modification necessitates a

change in the PSM. Depending on the modifications of an existing process unit, PSM may not apply if no change to Process Safety Information is expected. However, to ensure all proposed project components are evaluated and early compliance with regulatory requirements, mitigation measure HHM-1 is required so that applicable plans and Pre-Startup Reviews are completed for all proposed project components prior to the commencement of operations associated with new and modified project components, regardless of whether or not they are required to be included in the PSM.

HHM-1 To ensure all proposed project components are evaluated and early compliance with regulatory requirements are met, implementation of this mitigation measure shall be completed prior to the commencement of operations associated with new and modified project components. The applicant shall demonstrate to the Los Angeles City and County Fire Departments compliance with applicable hazardous material rules and regulations, to include, at minimum, an Emergency Action Plan as required by the Fire Department addressing spill, fire, and explosion hazards and relative risk of upset to adjacent land uses; PSM requirements under 40 CFR Part 1910, Section 119, and Title 8, CCR, Section 5189; and Article 2, Chapter 6.95 of the California Health and Safety Code that require facilities that handle listed regulated substances to develop RMPs to prevent accidental releases of these substances.

4.3.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The impacts of the proposed project on hazards associated with the Naphtha Isomerization Unit, new crude tanks, SARP, and Interconnecting Pipelines are expected to be significant. Compliance with existing PSM, RMP, and CalARP regulations and implementation of the recommended safety measures would minimize the potential impacts associated with a release, but are not expected to eliminate the potential hazard impacts. No feasible mitigation measures were identified to further reduce significant adverse hazard impacts. Therefore, hazards and hazardous material impacts generated by the proposed project are expected to remain significant.

4.4 HYDROLOGY AND WATER QUALITY

The NOP/IS (see Appendix A) determined the hydrology and water quality impacts of the proposed project at the Tesoro Los Angeles Refinery were potentially significant for water supply. The potential adverse impacts of the proposed project on water supply will be evaluated in this section. The NOP/IS also concluded that the proposed project would have less than significant impacts to water quality including wastewater generation. However, to provide a complete understanding of the water supply and wastewater discharge relationship, a discussion of the proposed project wastewater impacts is provided along with the analysis of water supply impacts.

4.4.1 SIGNIFICANCE CRITERIA

The proposed project impacts on hydrology and water quality would be considered significant if the following occurs:

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 262,820 gallons per day of potable water.
- The project increases demand for water by more than five million gallons per day.

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of NPDES permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.

4.4.2 ENVIRONMENTAL IMPACTS

4.4.2.1 Water Demand

4.4.2.1.1 Construction Impacts

Water demand during construction is limited to water applied for dust suppression and water needed to perform hydrostatic testing of new tanks and pipelines. Potential water demand impacts during construction are evaluated in the following subsections.

Dust Suppression

During construction of the proposed project, water will be needed for dust suppression as required during grading operations to prepare the construction areas for the placement of foundations for new equipment. Grading activities are expected to be limited to a two to three week period for each project component that has foundations (e.g., the new tanks, and the new SARP) and are not expected to overlap. Construction at the Carson Operations is expected to use an estimated maximum volume of 6,000 gpd of potable water based on the expected area to be graded for the six new crude tanks. Thus, construction at the Carson Operations will increase potable water demand. While the Carson Operations currently purchases reclaimed water, the Carson Operations purchases the maximum amount of reclaimed water available and no additional reclaimed water is available for purchase for dust suppression activities.

Only potable water is supplied to the Wilmington Operations by LADWP, potable water demand at the Wilmington Operations is estimated to be a maximum of 4,000 gpd for dust suppression purposes based on the expected area to be graded for the two new replacement crude storage tanks. Based on the construction schedule (see Figure 2-18), a number of construction activities during the peak construction period at the Carson Operations and the Wilmington Operations would occur simultaneously, but it is not clear whether or not peak water demand for dust control activities would occur specifically during these overlapping construction activities. Therefore, to ensure the most conservative water demand is analyzed, water demand from both Operations is assumed to occur at the same time and are analyzed concurrently, resulting in a potential potable water demand of 10,000 gpd, which is less than the SCAQMD significance threshold of 262,820 gpd of potable water and, thus, less than significant.

Hydrostatic Testing

During construction of the proposed project, water will also be needed to perform hydrostatic testing of the new tanks and connective piping. Hydrostatic testing involves filling a tank or piping with water to check for leaks and does not require the use of potable water. The water used for the hydrostatic testing tanks and associated tank piping will be Refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Using diverted wastewater will eliminate the need for additional potable water supplies and will not increase the amount of wastewater generated by the Refinery, but will vary the discharge rate during construction. While the wastewater is diverted, the total daily discharge rate of the Refinery will decrease and upon completion of hydrostatic testing, the discharge rate will temporarily increase. It is expected that for a total of approximately four to six weeks distributed over the construction period, a temporary daily increase in water discharge will occur at the completion of hydrostatic testing.

New tanks and associated tank piping at the Carson Operations would be hydrotested using cooling tower blowdown water. Cooling tower blowdown is a wastewater stream which is discharged from the Carson Operations to the Los Angeles County Sanitation District (LACSD) sewer system. The Carson Operations currently discharge an average of approximately 3,650 gpm of treated wastewater to the LACSD with historic maximum discharges greater than 5,200 gpm, which is below the permitted discharge limit of 12,000 gpm. The typical rate for cooling

tower blowdown is 1,000 gpm. During hydrostatic testing of the six new 500,000 barrel tanks, the cooling tower blowdown water will temporarily not be discharged to the LACSD and will be diverted for hydrostatic testing. Upon completion of the hydrotest for the new 500,000 barrel tanks and piping, the hydrotest water will be routed back to the Carson Operations for treatment, if necessary, and discharge to the LACSD. It is expected that the wastewater used for the testing will be discharged at a rate of no greater than 1,500 gpm for a temporary increase in the discharge rate to 5,150 gpm, which is less than the rate achieved in the past and is well below the permitted discharge rate. The available capacity in the daily discharge rate (permitted 12,000 gpm – current discharge 3,650 gpm = 8,350 gpm available) is sufficient to accommodate the hydrotest wastewater discharge without requiring additional water supplies or wastewater treatment facilities. Therefore, no permit modification or new wastewater treatment facilities are needed to accommodate the temporary increase in discharge of wastewater during hydrostatic testing from the Carson Operations.

New tanks and associated piping at the Wilmington Operations would be hydrotested with up to approximately 300,000 bbl of diverted treated process wastewater from the wastewater storage tank over a period of approximately one to two weeks. After being used for hydrostatic testing, the water will be returned to the Refinery wastewater system for discharge to the LACSD sanitary sewer system. The Wilmington Operations wastewater discharge limit is 10,000 gpm and the Wilmington Operations typically discharge an average of approximately 2,000 gpm during dry weather and 2,300 gpm during wet weather with historic maximum discharges greater than 3,000 gpm. It will take 300,000 barrels of wastewater to hydrotest the two new tanks, which would all be supplied by diverted wastewater. Once hydrostatic testing is complete, the wastewater will be treated again, if necessary, and discharged to the LACSD sewer system at a rate of approximately between 400 and 700 gpm for a temporary increase in the discharge rate to 3,000 gpm or less, which is less than or equal to the rate achieved in the past and is well below the permitted discharge rate. The available discharge capacity (10,000 gpm limit– current discharge 2,300 gpm = 7,700 gpm available) is sufficient to accommodate the hydrotest wastewater discharge. Therefore, no permit modification or new wastewater treatment facilities are needed to accommodate the temporary increase in discharge of wastewater during testing from the Wilmington Operations.

As indicated above, demand for water to perform hydrostatic testing of new tanks at both the Carson and Wilmington Operations can be supplied entirely using current wastewater streams at each operation. Once hydrostatic testing is completed, the hydrostatic testing wastewater would be returned to the Refinery's existing wastewater stream, treated as necessary, and then released to the LACSD sanitary sewer system without exceeding current wastewater limits, requiring changes to existing wastewater permit conditions, or requiring new wastewater permits.

Connective piping in process units at both the Carson and Wilmington Operations and the Interconnecting Pipelines that will be routed under the Alameda Corridor and Sepulveda Boulevard will be hydrotested using potable water, as there will be no access to the wastewater system at either the Carson or Wilmington Operation.

Given the large amount of time that will elapse between hydrostatic testing for the Interconnecting Pipelines and the tanks, even if hydrostatic testing for the Interconnecting

Pipelines is somewhat delayed, it is not expected to overlap with tank hydrostatic testing. Therefore, it is not expected that the fill rate of pipelines for hydrostatic testing would exceed the pump limit of 500 gpm, which corresponds to less than 30,000 gpd. Therefore, it is expected that a maximum of 30,000 gpd of potable water would be used to perform hydrostatic testing for the Interconnecting Pipelines installed at the Refinery as part of the proposed project.

The wastewater generated during hydrostatic testing of Interconnecting Pipelines will be a temporary wastewater stream generated during construction activities. The wastewater will be collected and added to the normal wastewater discharge at a rate no greater than that used for tank hydrostatic testing (i.e., less than 1,500 gpm at the Carson Operations and less than 700 gpm at the Wilmington Operations). As piping is completed it will be hydrotested and, where possible, the water will be transferred from one piping segment to the next completed segment. Hydrostatic testing for the new tanks would occur after completion of tank construction, approximately six months after completion of the Interconnecting Pipelines. Therefore, it is not expected that hydrostatic testing of Interconnecting Pipelines will occur concurrently with hydrostatic testing of tanks. Thus, adequate capacity in the current wastewater treatment facilities is available and no permit modifications would be required.

The total maximum daily potable water demand during construction is expected to be 40,000 gpd (10,000 gpd associated with dust suppression activities and up to 30,000 gpd for hydrostatic testing all new pipelines), which is less than the significance threshold of 262,820 gpd. Therefore, the proposed project will have less than significant impacts on water supply during construction. Further, wastewater diverted from existing wastewater streams for hydrostatic testing purposes as part of the proposed project is expected to be discharged in compliance with the existing Industrial Wastewater Discharge Permits (IWDPs) for the Refinery after completing the hydrostatic testing process. Since construction water discharges are expected to be discharge under the existing IWDPs, construction is not expected to require discharging wastewater under an NPDES permit. Therefore, changes to existing permit conditions will not be required and no violations of existing NPDES permit limits are expected.

4.4.2.1.2 Operational Impacts

The Refinery currently uses on average about 13.8 million gpd of fresh/potable water and about 4.5 million gpd of reclaimed water in its operations. At the time that the NOP/IS was prepared, it was estimated that the proposed project would result in a reduction in water demand because of shutting down the FCCU. However, upon further analysis, new or modified equipment has the potential to increase water demand. As shown in Table 4.4-1, the direct water demand of the proposed project is expected to require an estimated 173.4 gpm (about 249,696 gpd) of water for cooling purposes, an estimated 50 gpm (about 72,000 gpd) of boiler feed water, and an estimated 10 gpm (about 14,400 gpd) of water for desuperheating (i.e., to lower the temperature of superheated steam). Shutting down the FCCU at the Wilmington Operations as part of the proposed project will reduce existing wash water demand by an estimated 99 gpm (about 142,560 gpd) and cooling water by an estimated 415.50 gpm (about 598,320 gpd) as shown in Table 4.4-1. Therefore, the proposed project will increase the net direct water demand at the Refinery by about 76.5 gpm or about 110,160 gpd, which is less than the SCAQMD potable water demand significance threshold of 262,820 gpd.

Table 4.4-1

Proposed Project Water Demand

Activity	Rate (gpm)	Rate (gpd)
Direct Water Demands		
Carson Cooling Water [(a)]	173.40	249,696
Carson Boiler Feed Water	50.00	72,000
Carson Desuperheater Water	10.00	14,400
Wilmington Cooling Water [(b)]	-415.50	-598,320
Cooling Water, New SARP	357.60	514,944
Wilmington Wash Water [(c)]	-99.0	-142,560
Subtotal, Direct Water Demand	**76.5**	**110,160**
Indirect Water Demands		
Wilmington Cooling Water	56.33	81,115
Subtotal, Indirect Water Demand	**56.33**	**81,115**
Total Water Demand	**132.83**	**191,275**
Significance Threshold		**262,820**
Significant?		**No**

Note: Negative numbers represent reductions in water demand.

(a) Associated with changes at the Naphtha HDS, No. 51 Vacuum, Alkylation, and Wet Jet Treater Units

(b) Associated with the Wilmington FCCU shutdown, and changes at the HTU-1 and HTU-4 Units.

(c) Associated with the Wilmington FCCU shutdown.

The proposed project will require the installation of additional eye washes and emergency showers, which require potable water, near the new units. However, no constant increase in potable water demand is expected from the addition of these eye washes and showers, as the proposed project is not expected to increase the number of employees. The hazard analysis indicated that some modified and new equipment have the potential to create significant adverse impacts, which could result in the increased use of showers and eye washes. However, such incidents would occur extremely rarely, if ever, and additional water demand would return to the baseline levels after the incident is over.

As discussed in Section 4.1.2, equipment potentially indirectly affected by the proposed project (upstream and downstream) was evaluated to determine if the proposed project would result in an indirect water demand increase. Potential indirect water demand impacts, which are associated with increased processing in the downstream units that will require additional cooling, are included in the total water demand impact analysis of the proposed project (see Table 4.4-1). The overall change in water demand associated with implementing the proposed project is shown in Table 4.4-1. The combined total of the proposed project direct water demand and the additional indirect water demand from downstream units is 191,275 gpd.

As discussed in Section 3.4.1, the Refinery owns and operates private water wells to produce process water and purchases additional potable and reclaimed water to supplement the water drawn from the wells. The Refinery has adjudicated water rights that allow the production of up to 2.8 billion gallons of water per year from its wells. However, declining water production from two of the wells owned by the Refinery in the recent past has restricted the Refinery operators from using their historic production quantities within their adjudicated rights (as shown in Table 3.4-1, only 1.875 and 1.62 billion gallons per year were produced in 2012 and 2013, respectively). In 2014, the two old water producing wells were replaced with two new wells to allow the Refinery to produce additional quantities of well water within its adjudicated water rights. The two old wells were abandoned. The Watermaster Service Report (applicable water supply assessment per CEQA Guidelines Section 15155) provides the reported and allowed water use within the Basin, which bases future water availability on the adjudicated water rights within the Basin for regional water management. The incremental increase in water demand of 191,275 gpd (approximately 69.8 million gallons per year) from the proposed project is expected to be produced by the privately-owned wells (i.e., from the available 1.2 billion gallons per year of adjudicated water rights). The existing water supply can meet the water demand of the proposed project and the daily water demand associated with the proposed project is less than the significance threshold of 262,820 gpd. Therefore, the proposed project water supply impacts are expected to be less than significant.

The proposed project is expected to reduce overall wastewater generated during operation at the Refinery by an estimated 55.1 gpm (79,344 gpd) (see Table 4.4-2). This is due, in large part, to the shutdown of the Wilmington Operations FCCU. While there will be an increase in wastewater generation from some operations, such as the SARP, adequate capacity in the existing wastewater treatment facilities is available as described in Section 4.4.2.1.1. Therefore, no new wastewater treatment facilities are needed and the existing facilities are adequate to meet the needs of the proposed project. As such, the proposed project water quality impacts would be less than significant.

4.4.3 MITIGATION MEASURES

No significant impacts associated with water demand and wastewater discharge are expected from the proposed project, so no mitigation measures are required.

4.4.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The proposed project impacts on hydrology and water quality are expected to be less than significant.

Table 4.4-2

Wastewater Changes Associated with the Proposed Project

Affected Process	Rate Change (gpm)	Rate Change (gpd)
Carson Stripping Steam	8.0	11,520
Carson Cooling Tower Blowdown	34.7	49,968
Wilmington Cooling Tower Blowdown	-73.8	-106,272
Carson Boiler Blowdown	3.5	5,040
Carson Desuperheater Water[(a)]	0.0	0
Wilmington Wash Water[(b)]	-99.0	-142,560
New SARP	71.5	102,960
Wastewater Discharge Change	-55.1	-79,344

Note: Negative numbers represent reductions in wastewater generation.
(a) Condensate is recycled.
(b) Associated with the Wilmington FCCU shutdown.

4.5 NOISE

The NOP/IS (see Appendix A) determined that the proposed project at the Tesoro Los Angeles Refinery has the potential to generate significant adverse noise impacts during construction and operation. Potential noise impacts associated with the proposed project construction and operational activities are evaluated in this section. The noise analysis in Section 4.5 is based on the Noise Impact Assessment prepared for the proposed project by Navcon and found in Appendix D.

4.5.1 THRESHOLDS OF SIGNIFICANCE

Sensitive noise receptors in the vicinity of the proposed project fall within three jurisdictions, the Wilmington District of the City of Los Angeles, the City of Carson, and the City of Long Beach (see Figure 3.5-2). The significance thresholds used for this noise analysis rely on the Los Angeles CEQA Thresholds Guide (City of Los Angeles 2006) and the vibration significance criterion corresponds to Federal Transit Administration (FTA) Vibration Impact Criteria for General Assessment, which sets acceptability limits for vibration in buildings (including residential structure).

A project would be considered to have a significant adverse noise or vibration impact under the following circumstances:

- Construction of the proposed project would have a significant noise impact if construction noise levels exceed the local noise ordinances, or if the noise ordinance is currently exceeded, if ambient Community Noise Exposure Levels (CNEL) would be increased by 3.0 dBA or more at a noise sensitive receptor during the construction period.

- Operation of the proposed project would have a significant noise impact if proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, ambient CNEL noise levels would be increased by 3.0 dBA or more at a noise sensitive receptor.

- Construction and operation of the proposed project would have a significant vibration impact if ground vibration levels for residential structures would exceed 72 vibration decibels (VdB) for frequent events (70+ vibration events), 75 VdB for occasional events (30-70 events), and/or 80 VdB for infrequent events (30 or fewer events), the acceptability limits prescribed by the FTA.

The local noise ordinances are summarized in Subsection 3.5.3 for the jurisdictions in which the project is located (i.e., the Cities of Carson and Los Angeles). In order to provide a conservative analysis of noise impacts, noise impacts will be considered significant if there would be an increase of 3.0 dBA or more during construction and operational activities as the use of the noise ordinances could allow increases greater than 3.0 dBA.

4.5.2 ENVIRONMENTAL IMPACTS

4.5.2.1 Construction Noise Impacts

Proposed project construction is anticipated to increase noise levels temporarily at noise-sensitive (e.g., residential) receptors in the vicinity of the Tesoro Los Angeles Refinery, because heavy construction equipment is required during construction activities associated with the proposed project. The magnitude of the increases would depend on the type of construction activity, the noise level generated by various pieces of construction equipment, site geometry (i.e., shielding by intervening fences, buildings, and other structures), and the distance between the noise source and the receptors.

Noise from construction activities is generated by a broad array of construction equipment. Table 4.5-1 shows the noise level ranges of typical construction equipment. These noise sources will operate primarily during daylight hours and will be a source of noise over the construction period.

TABLE 4.5-1

Example of Noise Levels from Construction Noise Sources

EQUIPMENT	TYPICAL RANGE (decibels)[(a)]
Truck	82-95
Front Loader	73-86
Backhoe	73-95
Vibrator	68-82
Air Compressor	85-91
Saws	72-82
Jackhammers	81-98
Pumps	68-72
Generators	71-83
Compressors	75-87
Concrete Mixers	75-88
Concrete Pumps	81-85
Pile Driving (peaks)	95-107
Tractor	77-98
Scrapers, Graders	80-93
Pavers	85-88
Cranes	75-89

(a) City of Los Angeles, 2006. Levels are in dBA at 50-foot reference distance.

Construction noise levels were estimated based on the types of equipment proposed to be used on-site to complete the various construction activities. These sources include equipment such as loaders, dozers, cranes, trucks, pavers, etc. During any construction project, the overall average

noise levels vary with the level of construction activity and the types of equipment that are on-site and operating at a particular time. In order to provide a conservative estimate of potential noise impacts, the construction noise assessment in this EIR assumes that all construction activities would occur during the same timeframe and construction would occur 24-hours per day. As discussed in Section 2.8, the estimated construction schedule is expected to begin in third quarter of 2016 and be completed in second quarter of 2021. During normal construction periods, one work shift per day is expected beginning at 7 a.m. and ending at 5:30 p.m. (allowing 30 minutes for lunch). During Refinery turnaround periods (when some of the Refinery Units are shut down), two work shifts are expected and work may be conducted 24 hours per day. Shifts would operate from 6:00 a.m. to 6:00 p.m. and 6:00 p.m. to 6:00 a.m. It is common for construction/maintenance activities to occur 24 hours per day during all Refinery turnarounds to minimize the time when the Refinery unit is not operating and 24-hour construction maintenance activities normally occur during all Refinery turnarounds. The construction noise was modeled using the SoundPLAN model to estimate the noise levels that would occur within the residential areas adjacent to the Carson and Wilmington Operations.

The sound pressure levels at 50 feet were used to determine the equipment sound power emission levels using the procedures described in the Federal Highway Administration (FHWA) Roadway Construction Noise Model (FHWA-RCNM October 2006) and the Federal Transit Authority (FTA) Noise and Vibration Guidance Handbook. The construction noise source data are summarized in Appendix D. The construction noise model parameters were as follows:

- The construction noise model represents a worst-case scenario by assuming that all construction activities will occur at the same time.

- The construction noise power emission levels were based upon FHWA Roadway Construction Noise Model.

- The construction equipment was modeled as a line stationary source along the pipelines.

Three dimensional noise models of the proposed project were created using the noise modeling software, SoundPLAN. Actual noise monitoring in the vicinity of the Refinery was used to estimate baseline noise levels (see Chapter 3.5.2.2 for further details). The results of the noise modeling associated with the proposed project construction activities are shown in Table 4.5-2.

There are several existing noise-sensitive populations adjacent to the Refinery. The closest residential areas to construction activities associated with the proposed project are residents west of Wilmington Avenue, adjacent the Tesoro property but 1,300 feet west of the construction area of the six new crude tanks (see Receptor #4, Table 4.5-2 and Figure 3.5-2). The predicted noise levels at the noise-sensitive locations during the construction period, as well as the change from the CEQA baseline levels, are summarized in Table 4.5-2. The noise increase associated with construction activities was predicted by subtracting the baseline noise estimates from the total noise estimates predicted during construction activities (i.e., Baseline and Construction noise estimates minus the Baseline noise estimates). As Table 4.5-2 shows, construction activities would add less than the significance threshold of 3.0 dBA to the adjacent residential

communities, including all noise-sensitive receptors. The noise levels at the closest residential areas are expected to increase from 0.1 to 0.9 dBA depending on the location and the time of day. No significant noise impacts related to project construction are expected within the nearby residential areas.

TABLE 4.5-2

Proposed Project Estimated Construction Noise Levels

Receptors[a]	Baseline 2014[b]			Construction			Baseline & Construction			Overall Change		
	CNEL[c]	Leq,d[d]	Leq,n[e]	CNEL	Leq,d	Leq,n	CNEL[f]	Leq,d	Leq,n	CNEL	Leq,d	Leq,n
#1 Merimac Ave/W Willard St, City of Long Beach	72.8	69.2	64.9	59.0	57.7	47.9	73.0	69.5	65.0	0.2	0.3	0.1
#2 Mauretania St/Goodrich Ave, City of Los Angeles	76.4	70.1	69.8	64.4	63.7	52.7	76.7	71.0	69.9	0.3	0.9	0.1
#3 Drumm Ave/E Sandison St. City of Los Angeles	72.7	68.4	65.4	58.6	57.2	47.7	72.9	68.7	65.5	0.2	0.3	0.1
#4 Wilmington Ave/E Pacific St. City of Carson	68.2	65.0	60.3	59.0	58.2	47.2	68.7	65.8	60.5	0.5	0.8	0.2

(a) Refers to noise locations shown in Figure 3.5-2.
(b) Includes all ambient noise sources. Noise levels are from Table 3.5-3.
(c) CNEL – Community Noise Exposure Level (5 dB penalty 7 p.m. – 10 p.m., 10 dB penalty 10 p.m. – 7 a.m.).
(d) Leq,d – Average Sound Level Day Time (7 a.m.– 10 p.m.).
(e) Leq,n – Average Sound Level Night Time (10 p.m. – 7 a.m.).
(f) The total sound level was modeled, see Appendix D. Sound is measured on a logarithmic scale and, therefore, baseline combined with construction is not simply additive.

Workers exposed to noise sources in excess of 85 dBA for an eight-hour period will be required to wear hearing protection devices that conform to OSHA/NIOSH standards (see Subsection 3.5.3.1). Required compliance with the applicable OSHA and NIOSH standards (as described in Subsection 3.5.3.1) will ensure that construction workers are not exposed to harmful noise levels in excess of 85 dBA for an eight-hour time period.

Based on the above analysis, all potential noise impacts from the proposed project during the construction phase are expected to be less than significant.

4.5.2.2 Operational Noise Impacts

The proposed project will add equipment to the existing Refinery so that there will be additional operational noise sources at the facility. Additional noise sources associated with the proposed

project generally include process equipment components such as valves, flanges, vents, pumps, and compressors. Additional noise sources at the Refinery are expected to include the following:

- New pumps associated with the No. 51 Vacuum Unit modifications;
- New air cooler and pumps associated with the HCU modifications;
- New pumps associated with the LPG rail unloading rack;
- New pumps associated with the HTU-4 modifications;
- New air cooler and pumps associated with the Naphtha HDS Unit modifications;
- New pumps associated with the Naphtha Isomerization Unit modifications;
- New pumps associated with the Alkylation Unit modifications;
- New equipment associated with the Wet Jet Treater;
- New pumps associated with the new crude storage tanks;
- New equipment associated with the PSTU;
- New pumps associated with CRU-3;
- New pumps associated with the HTU-1 and HTU-2 modifications;
- New equipment associated with the SARP; and
- New equipment (Venturi Scrubber) associated with the Coker Unit modifications.

In addition to the increase in the number of noise sources at the Refinery, the proposed project will also remove noise sources at the Wilmington Operations FCCU; however, the reduction in noise associated with the shutdown of the Wilmington Operations FCCU was not included in the noise analysis to provide a conservative estimate of project noise impacts. Noise impacts during operational activities were estimated after the completion of construction activities when all new sources are expected to be operational. Refinery operations are continuous over a 24-hour period.

The SoundPlan model predicted noise levels at full operation for all noise sources associated with the proposed project, including increased traffic (see Table 4.5-3). The noise increase associated with proposed project (only) was predicted by subtracting the baseline noise estimates from the total Baseline and Operation noise estimates predicted (i.e., Baseline plus Operations noise estimates, minus Baseline noise estimates).

As shown in Table 4.5-3, the model results indicate that the CNEL levels within residential areas would increase by less than the 3.0 dBA significance threshold as a result of the operation of the proposed project. The only projected noise increase (0.1 dBA at Receptor 2) is the residential area west of Alameda Street, north of Pacific Coast Highway. The noise levels associated with the operation of the proposed project at the three other sensitive noise receptor locations are expected to remain the same as existing noise levels at all residential receptors adjacent to the Refinery, i.e., no changes in noise levels are expected. Potential noise impacts at all receptor locations are predicted to be less than 3.0 dBA and, therefore, noise impacts associated with the operation of the proposed project would be less than significant.

Portions of the proposed project are expected to become operational during the construction period. As shown in Table 4.5-3, the change in operational noise levels is not expected to be discernible from baseline noise levels. Therefore, the results in Table 4.5-2, which are less than

significant, are representative of the expected noise levels during the period of construction that is concurrent with operation of the proposed project.

TABLE 4.5-3

Project Operational Noise Levels

Receptors[a]	Baseline 2014[b]			Operations			Baseline & Operations			Overall Change		
	CNEL[c]	Leq,d[d]	Leq,n[e]	CNEL	Leq,d	Leq,n	CNEL[f]	Leq,d	Leq,n	CNEL	Leq,d	Leq,n
#1 Merimac Ave/W Willard St. City of Long Beach	72.8	69.2	64.9	46.0	39.3	39.3	72.8	69.2	64.9	0.0	0.0	0.0
#2 Mauretania St/Goodrich Ave, City of Los Angeles	76.4	70.1	69.8	59.3	52.6	52.6	76.5	70.2	69.9	0.1	0.1	0.1
#3 Drumm Ave/E Sandison St, City of Los Angeles	72.7	68.4	65.4	45.8	39.1	39.1	72.7	68.4	65.4	0.0	0.0	0.0
#4 Wilmington Ave/E Pacific St, City of Carson	68.2	65.0	60.3	42.9	36.3	36.3	68.2	65.0	60.3	0.0	0.0	0.0

(a) Refers to the sampling locations identified in Figure 3.5-2.
(b) Includes all ambient noise sources. Noise levels are from Table 3.5-3.
(c) CNEL – Community Noise Exposure Level (5 dB penalty 7 p.m.– 10 p.m., 10 dB penalty 10 p.m.– 7 a.m.).
(d) Leq,d – Average Sound Level Day Time (7 a.m.– 10 p.m.).
(e) Leq,n – Average Sound Level Night Time (10 p.m.– 7 a.m.).
(a) The total sound level was modeled, see Appendix D. Sound is measured on a logarithmic scale and, therefore, baseline combined with construction is not simply additive.

4.5.2.3 Vibration Impacts

Construction of the proposed project would involve equipment and activities that may have the potential to temporarily generate groundborne vibration. Groundborne vibration is generally caused by equipment with moving or oscillating parts. Construction equipment is operated sporadically during different construction activities and involves movement of the construction equipment or movement of other objects (e,g., moving dirt piles or site grading, moving new equipment into place, removing equipment no longer being used, etc.) by construction equipment. The FTA has published standard vibration levels and peak particle velocities[1] for construction equipment operations (FTA, 2006). The approximate velocity level and peak particle velocities for large construction equipment are listed in Table 4.5-4. Groundborne vibration is quantified in terms of decibels, since that scale compresses the range of numbers required to describe the oscillations. The FTA uses vibration decibels (abbreviated as VdB) to measure and assess vibration amplitude. In the United States, vibration is referenced to one

[1] The peak particle velocity is defined by the FTA as the maximum instantaneous positive or negative peak of a vibration signal.

micro-inch/sec (converted to 25.4 micro-mm/sec in the metric system) and presented in units of VdB. Based on the activities and equipment which would be used during the proposed project construction phases, the construction equipment source levels are estimated to range between 58 VdB and 100 VdB at a distance of 25 feet.

TABLE 4.5-4

Construction Vibration Impacts

Equipment	Estimated Peak Particle Velocity at 25 Ft. (inches/second)[(a)]	Estimated Velocity Level at 25 Ft. (VdB) [(b)]	Estimated Velocity Level at Closest Residential Area (VdB)	Significant? (Exceeds 72 VdB)[(c)]
Pile Driver typical	0.644	100	71	No
Large Bulldozers	0.089	87	58	No
Loaded Trucks	0.076	86	57	No
Jackhammer	0.035	79	50	No
Small Bulldozer	0.003	58	29	No

(a) Source: FTA, 2006. Data reflects typical vibration level.
(b) Distance to closest off-site receptor. Assumes an estimated six VdB reduction for every doubling of distance per FTA 2006.
(c) FTA Ground-Borne Vibration Impact Level (FTA, 2006).

When analyzing groundborne vibration, the FTA recommends using an estimated six VdB reduction for every doubling of distance (FTA, 2006). Using the FTA methodology, the groundborne vibration levels at the closest residential receptor (about 1,300 feet west of the six new crude oil storage tanks), the VdB would range from 29 to 71 VdB (see Table 4.5-4). The predicted vibration during construction activities can be compared to the FTA groundborne vibration impact level of 72 VdB, which is the level above which human annoyance or interference with vibration-sensitive equipment is expected to occur. Levels of vibration below the FTA groundborne vibration impact level are considered less than significant by the FTA. Therefore, because the vibration from construction activities is less than the FTA vibration impact level significance threshold and because the SCAQMD is using the same groundborne vibration level significance threshold as the FTA, no significant adverse vibration impacts are expected during the construction period.

The equipment associated with the operation of the proposed project is not expected to generate detectable groundborne vibration during normal operation because new and modified equipment is not expected to have oscillating parts which have the potential to generate groundborne vibration. Therefore, vibration from operation of the proposed project is expected to be less than significant and no significant vibration impacts are expected during operation.

4.5.3 MITIGATION MEASURES

No significant adverse impacts associated with noise or vibration are expected from the proposed project during construction or operational phases, so no mitigation measures are required.

4.5.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The noise or vibration impacts of the proposed project during construction and operational activities are expected to be less than significant.

4.6 SOLID AND HAZARDOUS WASTE

The NOP/IS (see Appendix A) determined that construction and operation of the proposed project could generate potentially significant adverse solid and hazardous waste impacts. Therefore, Section 4.6 addresses the potential solid and hazardous waste impacts associated with the proposed project.

4.6.1 THRESHOLDS OF SIGNIFICANCE

The proposed project would have a significant impact on solid and hazardous waste if it would:

- Result in an increase in solid or hazardous waste generation due to project operations that would exceed the capacity of existing solid or hazardous waste handling and disposal facilities.

4.6.2 CONSTRUCTION IMPACTS

Solid Waste: Construction activities will involve some demolition, grading, and excavating activities that could generate solid waste. Demolition activities could generate demolition waste, while grading and excavating could uncover contaminated soils since the proposed project activities are located in existing industrial areas.

Construction and demolition associated with the proposed project could generate debris in the form of concrete, asphalt, structural elements, metal waste, and other building components, some of which would require disposal in a landfill. In 2008, debris from construction and demolition made up approximately 16 percent of the State of California's waste disposal (CIWMB/CalRecycle 2009). Asphalt and concrete are typically recycled for aggregate base or, due to lower disposal costs, may be disposed of at inert landfills (e.g., Azusa landfill) instead of municipal landfills.

The proposed project includes the demolition and removal of two existing storage tanks and affected existing piping at the Wilmington Operations. The tanks and piping are constructed of steel. Because steel is a commodity, it would be sent for recycling in lieu of disposal in a landfill. Demolition of the concrete pads of the existing tanks is expected to result in an estimated 265 cubic yards of concrete waste material that would be transported off-site for crushing and recycling.

Solid waste (i.e., construction debris and non-hazardous soil) generated during construction of the proposed project that may require disposal will be stored on the Refinery property prior to disposal at one of the landfills in southern California. Daily shipments of solid waste to landfills would be scheduled to avoid exceeding the landfills' permitted daily capacities, if applicable. The total remaining permitted Class III landfill capacity in southern California is estimated to be approximately 129.2 million tons (about 2,584 million cubic yards). The landfills in southern California have the capacity to accept the solid waste produced during the construction phase of the proposed project on a one-time basis (see Table 3.6-6). In addition, because a percentage of

the solid waste has economic value (steel) or can be recycled (concrete), the amount of solid waste generated by the construction of the proposed project (206,953 cubic yards, see Table 4.6-1) is expected to be relatively small compared to the total amount of solid waste generated in Los Angeles County (over 8,800,000 tons per year, see Table 3.6-4). Therefore, the proposed project is not expected to result in a significant impact on solid waste during the construction phase.

Hazardous Waste: Site preparation, grading, and construction activities for the proposed project have the potential to encounter contaminated soils. As part of the planning for the proposed project, soil samples have been collected in areas of the Refinery where construction is expected to take place to characterize the soil (i.e., uncontaminated, hazardous or non-hazardous waste designation). A conservatively high estimate of the volume of contaminated soil that could potentially be encountered during project construction has been developed (see Table 4.6-1). Based on the soil samples, it is estimated that a total of approximately 290,148 cubic yards of contaminated soil may be encountered during construction, which would require removal and reuse or disposal: Of the total, it is estimated that approximately 83,213 cubic yards would be hazardous waste, and approximately 206,953 cubic yards would be non-hazardous waste. Reuse of non-hazardous soil suitable for fill on proposed project components is expected to reduce the quantity of soil transported offsite for disposal.

With respect to contaminated soils (both hazardous and non-hazardous), Tesoro would consider the type and extent of contamination and explore the variety of options available for disposal and remediation. Laboratory analyses for characterization of the excavated soil will be compared to criteria established for acceptable levels of contaminants for the various disposal and remediation options, which could include *in situ*, on-site, and off-site treatment (e.g., incineration, soil vapor extraction, bioremediation, etc.). As shown in Table 4.6-1, an estimated 83,213 cubic yards of soil may be considered hazardous waste. Hazardous contaminated soil that cannot be treated/remediated could be taken to Kettleman Hills Landfill, Clean Harbors Buttonwillow, or another Class I landfill in the United States. The Kettleman Hills facility has sufficient available capacity of about 5,000,000 cubic yards and the Clean Harbors Buttonwillow facility has available capacity of over 8,000,000 cubic yards to handle the estimated one-time contaminated soil waste generated by construction activities associated with the proposed project. In addition, other hazardous waste disposal facilities are available for off-site disposal in other states. Since the amount of disposal capacity necessary to dispose of contaminated soils is well below the capacity of the available Class I landfills, no significant adverse hazardous waste impacts will occur from the proposed project. Non-hazardous soil that cannot be used onsite will be disposed of at a Class III landfill. The construction impacts associated with the proposed project represent a one-time increase in solid/hazardous waste during the construction phase only.

The potential for exposure to contaminated soil, the potential impacts, and the applicable rules and regulations are discussed in Section 4.3.2.6. It is expected that contaminated soil encountered during the proposed project construction would be managed in compliance with all applicable rules and regulations discussed in Sections 3.6.3 and 4.3.2.6.

TABLE 4.6-1

Estimated Waste Streams from Construction Activities

Description	Total Cubic Yards	Hazardous Waste (cubic yards)	Non-Hazardous Waste (cubic yards)
Wilmington SARP	3,261	783	2,478
Wilmington HTU-1	400	96	304
Wilmington HTU-1 &2	1,653	397	1,256
Wilmington HTU-4	3,734	896	2,838
Wilmington HCU	955	229	726
Wilmington HCU, CRU-3, PSTU	174	42	132
Wilmington Crude Tanks	95,000	20,000	75,000
Electrical Intertie	5,343	1,282	4,061
Carson Wet Jet Treater	1,011	243	786
Carson Naphtha HDS	1,318	316	1002
Carson Naphtha Isomerization Unit	689	165	524
Carson LHU	1,653	397	1,256
Carson Alky	1,133	272	861
Carson HCU	418	100	318
Carson No 51 Vac Unit	1,294	311	983
Carson Dehexanizer	982	236	746
Carson LPG Railcar U/L	764	183	581
Carson Steam Generation	640	154	486
Carson outside limits of existing units	29,160	6,998	22,162
Interconnecting Pipelines	50,566	10,113	40,453
Carson 500,000 bbl Crude Tanks	90,000	40,000	50,000
Total Waste Volume	**290,148**		
Total Hazardous Waste Volume		**83,213**	
Total Non-Hazardous Waste Volume			**206,953**

Prior to demolition, structures would be inspected by qualified personnel for the presence of asbestos-containing materials and lead-containing surface coatings (LCSCs) and/or lead-based paint (LBP). If asbestos that could become friable during demolition is found in a building material, or if LCSC and LBP are found, these materials would be removed and disposed of in compliance with U.S. EPA, the City of Los Angeles Bureau of Sanitation, and the South Coast Air Quality Management District regulations prior to demolition. Demolition of substantial Refinery structures, which is where asbestos, LCSC, LBP would most likely be found, is not included as part of the proposed project, so significant adverse impacts associated with LCSC, LBP, or asbestos are not expected. Note that the Wilmington FCCU is expected to be abandoned in place and the proposed project does not include demolishing it.

4.6.3 OPERATIONAL IMPACTS

Solid Waste: As noted in Subsection 3.6.1.2, Table 3.6-7, an average of 39,099 tons per year of solid waste was generated by the Tesoro Refinery in 2012/2013. Once the proposed project becomes operational, the average annual amounts of solid waste are not expected to change because there would be no increase in the number of workers and refinery units do not typically generate solid waste. Solid waste is generated from routine office activities such as paper, cans, bottles, cardboard boxes, etc. There would be no increase in workers, so no increase in solid waste is expected.

Hazardous Waste: Wastes generated by the operation of the proposed project will be managed and/or disposed of in compliance with applicable federal, state, and local statutes and regulations discussed in Section 3.6.3. The proposed new and modified equipment associated with the proposed project will perform similar functions as the existing equipment and will use the same types of materials necessary to process crude oil into refined products. The proposed project is expected to increase the amount of spent sulfuric acid, primarily from the Carson Operations Alkylation Unit. Following completion of the SARP, eight trucks per day would transport spent sulfuric acid from the Carson Operations to the SARP at the Wilmington Operations. All of the spent sulfuric acid from Wilmington Operations would then be treated on-site and reused, so increased production of spent sulfuric acid will not create an additional hazardous waste stream from the Refinery requiring disposal.

The proposed project includes constructing the SARP which requires a sulfuric acid catalyst that is expected to be a silica-based vanadium salt complex catalyst. Therefore, the proposed project will result in an increase in the use of catalyst and is expected to generate increased amounts of spent catalyst waste associated with the SARP. The volume of catalyst to be used in the SARP is currently unknown but based on similar units operated at other facilities in the U.S., a portion of the catalyst (estimated to be 30 percent) is expected to require changing approximately every two to three years. The spent catalyst is expected to be recycled for the metal content. Recycling facilities are selected through a qualification process that evaluates availability to process the material, location, handling practices, and cost.

The Wet Jet Treater uses caustic to convert mercaptans to disulfides and reduces the total acid content of the feed. Spent caustic from the Wet Jet Treater will be generated at a rate of approximately 4.5 gpm or about 6,480 gpd. Additionally, caustic vent scrubbers may be installed for air pollution control at the SARP. The combined use of caustic from the Wet Jet Treater, and SARP will bring the rate of spent caustic generation to approximately 11 gpm or 12,960 gpd. Spent caustic is currently recycled or reused on-site in the Refinery and then discharged. The spent caustic that is not reused on-site will first be transported via truck to the Ventura Trucking facility (located adjacent to the Tesoro administration building on 223rd Street) where it would be loaded onto rail (approximately four railcars per week) and sent to the Gulf Coast for recycling. No additional waste streams that require disposal will be generated by the Wet Jet Treater or the SARP. Since all spent caustic will be sent to a recycling facility for regeneration, increased production of spent caustic will not create an additional hazardous waste stream from the Refinery requiring disposal.

The operation of storage tanks does not routinely generate non-hazardous or hazardous wastes. The proposed project has the potential to generate additional sludge during tank cleaning operations which occur once every ten to 20 years. Periodically, for maintenance, storage tanks are currently emptied and cleaned, resulting in a sludge that generally requires treatment to recover useful product (oil), etc., and disposal (e.g., disposal at a hazardous waste or non-hazardous waste landfill, depending on the concentration of various constituents). The proposed project includes the replacement of existing Tanks 80035 and 80036 with larger new Tanks 300035 and 300036 and the construction of six new crude oil storage tanks. The proposed project could generate additional amounts of sludge wastes associated with periodic tank cleaning operations. The daily volume of waste generated during the periodic cleaning of the new storage tanks is expected to be about the same as current operations because no change in the method for tank cleaning is proposed and no more than one storage tank would be cleaned at any time. It takes several days to several weeks to clean storage tanks, depending on the size and the material stored in the tanks. The sludge is expected to remain on-site and will be used as feedstock to the DCU (i.e., recycled on-site); therefore, no increase in waste disposal would be expected from operation of the new and modified storage tanks. Both Carson and Wilmington Operations currently recycle oil-bearing refinery materials, such as tank bottoms into the DCUs. Additionally, since both Carson and Wilmington DCUs currently handle tank bottoms and no change in the volume of daily tank bottom recovery is expected, the proposed project will have no effect on the DCU's capacity to handle tank bottom sludge volumes after the proposed project becomes operational. Therefore, no increase in waste disposal would be expected from the storage tanks.

As explained above, while operation of the proposed project may generate solid or hazardous waste streams, those waste streams are: not expected to exceed the disposal capacity of any landfills where the waste would likely be sent or would be reused or recycled. Therefore, operation of the proposed project is not expected to require additional waste disposal capacity and will not interfere with the Tesoro Refinery's ability to comply with existing federal, state, and local regulations for solid and hazardous waste handling and disposal. Therefore, significant solid and hazardous waste impacts are not expected from construction and operation of the proposed project.

4.6.4 MITIGATION MEASURES

No significant adverse impacts associated with solid or hazardous wastes are expected from the proposed project during construction or operational phases, so no mitigation measures are required.

4.6.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

No significant adverse solid or hazardous wastes impacts are expected.

4.7 TRANSPORTATION AND TRAFFIC

The NOP/IS concluded that the traffic impacts associated with the construction phase and parking during the construction phase were potentially significant and would be evaluated in the Draft EIR (see Appendix A). The other transportation and traffic issues were determined to be less than significant and do not require additional environmental review. Potential traffic impacts associated with the proposed project construction activities are evaluated in this section. The transportation and traffic analysis in Section 4.7 is based on the Traffic Impact Analysis prepared for the proposed project by Iteris and found in Appendix E.

The geographic study area of the transportation analysis includes streets and intersections that would be used by truck and automobile traffic in connection with the proposed project to gain access to and from the Tesoro Los Angeles Refinery. The study area includes streets and intersections within the Cities of Los Angeles, Carson, and Long Beach. The technical traffic analysis data, and worksheets for all analyses conducted for the baseline and impact scenarios are included in Appendix E, and provide additional details to support the findings of the impact analysis presented in this section.

The traffic study analysis includes several scenarios to describe baseline and future conditions without the proposed project, during the construction of the proposed project, and in the operational phase of the proposed project. The traffic study includes analyses of baseline conditions, peak construction activities, and year 2020 traffic conditions, which represent future traffic growth and operating conditions at study locations due to population growth not associated with the proposed project. Therefore, this analysis addresses the proposed project's contribution to cumulative traffic growth and congestion.

4.7.1 THRESHOLDS OF SIGNIFICANCE

Transportation and traffic significance criteria are based on the location of each analyzed intersection and the proposed project's effect on traffic congestion at affected roadways and intersections. Two types of significance criteria will be used: the Intersection Capacity Utilization (ICU) methodology will be used for intersections under the Cities of Los Angeles, Carson, and Long Beach jurisdictions; and the Highway Capacity Manual (HCM) methodology will be used for intersections under Caltrans jurisdiction. The ICU methodology bases LOS on the volume-to-capacity ratio while the HCM methodology bases LOS on the average vehicle delay experienced by all vehicles traveling through the intersection. Table 3.7-1 presents both the V/C ratio and average delay associated with each LOS grade as well as a qualitative description of intersection operations at that grade.

For intersections under City of Los Angeles and Carson jurisdictions, the proposed project's impacts on transportation and traffic would be considered significant if any of the following significance criteria occurs (using the ICU methodology):

- Peak period levels on major arterials are disrupted to a point where the LOS is reduced to D, E, or F for more than one month.

- An intersection's volume to capacity (V/C) ratio increases by 0.02 (two percent) or more when the LOS is already D, E, or F.

For freeway ramp intersections, the proposed project's impacts on transportation and traffic would be considered significant if the following significance criteria occur (using the HCM methodology):

- Peak period levels on major arterials are disrupted to a point where the LOS is reduced to D, E, or F for more than one month.

The following significance thresholds apply to all portions of the proposed project, regardless of the jurisdiction:

- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.

- A major roadway is closed to all through traffic and no alternate route is available.

- The demand for parking facilities is substantially increased.

4.7.2 CONSTRUCTION IMPACTS

The proposed project's impacts on traffic during construction are discussed below and are based on when they will occur during the approximate five year construction cycle. Initial construction activities for the proposed project are expected to begin in the third quarter of 2016 and are expected to be completed by second quarter of 2021, based on preliminary project engineering. The preliminary construction schedule timing and duration for each component of the proposed project varies. The construction period when the most number of construction equipment and activities of the proposed project are expected to overlap is expected to occur in the first three years (peak construction period). Construction work shifts are expected to last about ten hours per day during most portions of the overall construction schedule. During normal construction periods, one work shift per day, five days per week is expected. During Refinery turnaround periods (when some of the Refinery Units are shut down), two work shifts are expected and work may be conducted 24 hours per day, seven days per week. Shifts would operate from 6:00 a.m. to 6:00 p.m. and 6:00 p.m. to 6:00 a.m. The traffic analysis presented below assumes that at least one Refinery turnaround will occur during the peak construction period to provide a conservative analysis of traffic impacts.

Although construction-related traffic is considered to be temporary in nature, i.e., ends after a proposed project becomes operational, a detailed analysis of construction period traffic impacts was conducted for the proposed project due to two factors:

1. The proposed project is expected to require a large number of workers and, therefore, could generate a large number of worker trips compared to typical development projects in southern California, and

2. The Interstate 405/Wilmington Avenue interchange is currently under construction. Caltrans estimates that construction at this interchange would be complete by early 2017. The baseline for the traffic analysis for the proposed project assumes that the Interstate 405/Wilmington Avenue interchange is in its preconstruction configuration. Construction of the Interstate 405/Wilmington Avenue interchange could overlap with the first phase of the proposed project construction. In order to provide a conservative analysis and because construction schedules can change, the traffic analysis of the peak construction period for the proposed project assumes that construction of the Interstate 405/Wilmington Avenue Interchange would not be complete and would be under construction during peak construction of the proposed project.

For these reasons, detailed analyses of construction period traffic impacts were conducted to identify potential significant impacts and because traffic impacts at one roadway segment were concluded to be significant, construction period traffic management strategies are required to mitigate those impacts.

4.7.2.1 Construction Traffic

Baseline conditions were obtained from turning movement traffic counts taken in August 2014 during the a.m. and p.m. peak hours of operation. The baseline trip estimates include trips to and from the Refinery and the parking lots to be used for the proposed project. Based on the traffic counts at the Refinery and parking lot driveways, there are a total of 1,060 daily round trips: 135 daily round trips from the 223rd Street parking lot, 912 daily round trips from the Alameda street parking lot, and 265 daily round trips from the Sepulveda Boulevard parking lot.

Construction traffic conditions are analyzed for the construction phase having the maximum number of construction trips (peak construction period) over the entire construction period. The traffic analysis is based on the preliminary construction schedule that included a total of 950 workers, 875 day shift workers and 75 night shift workers. The peak construction period trip generation is shown below in Table 4.7-1. Following the traffic study, the construction schedule has been refined and the number of workers has decreased. The decrease in total trips is within the margin of accuracy and using the original traffic estimate of 950 construction workers provides a worst-case estimate of traffic estimates. In total,696 workers will travel to and from the proposed project site during the highest trip-generation phase of construction of the proposed project (i.e., during Month 15). In addition to worker trips, 120 truck trips would be generated during the peak trip-generating construction phase throughout the work day. This traffic analysis that considers a higher number of trips, provides a conservative "worst-case" impact analysis.

TABLE 4.7-1

Construction Period Daily Trip Generation

Type	Work Shift	Total Round Trips	Total One-Way Trips
Supervisors	6 a.m.–5:30 p.m.	40	80
Workers	7:00 a.m.–5:30 p.m.	835	1,670
Workers	7:00 p.m.–7:00 a.m.	75	150
Trucks	Throughout the day	120	240
Total		**1,070**	**2,140**

Given the work shift hours for each type of worker, the following peak hour trip generation assumptions were made for this study:

- Peak morning hours are from 6:00 a.m. to 9:00 p.m.
- Peak evening hours are from 4:00 p.m. to 6:00 p.m.
- Supervisors would arrive before the a.m. peak hour and 50 percent would leave in the p.m. peak hour (40 supervisors x 50 percent x 10 percent carpool = 18 outbound p.m. peak hour trips).
- 50 percent of day shift workers would arrive during the a.m. peak hour and 50 percent would leave in the p.m. peak hour (835 workers x 50 percent x 10 percent carpool = 376 inbound trips in the a.m. peak hour and 376 outbound trips in the p.m. peak hour).
- 50 percent of night shift workers would leave in the a.m. peak hour and 50 percent would arrive in the p.m. peak hour (75 workers x 50 percent x 10 percent carpool = 34 inbound trips in the a.m. peak hour and 34 outbound trips in the p.m. peak hour).
- An average vehicle ridership (AVR) of 1.1, that is, 90 percent of the construction workers were assumed to drive to work alone.
- Truck trips are distributed evenly throughout the ten hour work day with 12 inbound and 12 outbound trips per peak hour. A passenger car equivalency (PCE) factor of 2.0 is applied to the truck trips to account for their larger size and slower turning speeds at intersections (120 trucks over 10 hours = 12 trucks per hour x 2.0 PCE = 24 PCE truck trips per hour inbound and outbound).

Of the 2,140 total daily one-way construction-related trips shown in Table 4.7-1, the number of PCE trips occurring in the peak hours are forecasted to be 458 PCE in the a.m. peak hour period, and 476 PCE trips in the p.m. peak hour period as shown in Table 4.7-2.

TABLE 4.7-2

Construction Period Peak Hour Trip Generation

Type	A.M. Peak Hour			P.M. Peak Hour		
	In	Out	Total	In	Out	Total
Auto	376	34	410	34	394	428
Truck (PCE)	24	24	48	24	24	48
Total	**400**	**58**	**458**	**58**	**418**	**476**

Trip distribution assumptions were used to determine the origin and destination of new vehicle trips associated with the proposed project. Trip distribution for the construction worker trips of the proposed project was developed using the weighted distribution of workers, from the 2010 U.S. Census, in Los Angeles, Orange, Riverside, and San Bernardino counties via the arterial network to cities near the study area (e.g. Carson, Compton, Long Beach, portions of Los Angeles, and Torrance) and the regional freeway network for cities more than two miles from the proposed project site.

Distribution of construction worker trips was 30 percent from Interstate 405 north of the proposed project site, 25 percent from Interstate 405 south of the proposed project site, 30 percent from Interstate 710 north of the proposed project site and 15 percent from local access along arterials. Truck trip distribution was assumed to occur to/from the north along Interstate 710 (see Appendix E for further details).

The LOS analysis was conducted to evaluate baseline LOS conditions at affected intersections compared to those same intersections with construction worker traffic during the a.m. and p.m. peak hours. Table 4.7-3 summarizes the LOS analysis results at the study intersections, which show that at one intersection construction worker traffic would contribute to an exceedance of a threshold of significance.

A major construction project at the Interstate 405/Wilmington Avenue interchange to modify the interchange started in November 2013, and is expected to be completed in late 2016 or early 2017. The Interstate 405/Wilmington Avenue interchange project includes reconfiguring existing on- and off-ramps from northbound and southbound Interstate 405, constructing a new on-ramp to southbound Interstate 405, reconstructing Wilmington Avenue and Lenardo Drive, and constructing a new bridge over the Torrance Lateral Channel. The Interstate 405/Wilmington Avenue Interchange project started before construction of the proposed project is to begin, i.e., during the baseline traffic conditions, and is expected to potentially overlap with the near-term construction period of the proposed project. Further, according to the traffic study, construction activities of the Interstate 405/Wilmington Avenue interchange project did not change the number of lanes provided by the interchange.

TABLE 4.7-3

Existing Plus Construction Period Conditions Intersection LOS

	Intersection	Existing Conditions						Existing Plus Construction Conditions						A.M. Change in V/C or Delay	P.M. Change in V/C or Delay	Significant Impact?
		A.M. Peak Hour			P.M. Peak Hour			A.M. Peak Hour			P.M. Peak Hour					
		V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS			
1	Wilmington Ave/Interstate 405 NB Ramps	0.499	21.4	C	0.395	18.5	B	0.500	21.5	C	0.395	18.6	B	0.1 s	0.1 s	No
2	Wilmington Ave/Interstate 405 SB Ramps	0.355	44.2	D	0.629	15.7	B	0.439	57.9	E	0.641	16.5	B	13.7 s	0.8 s	**Yes[a]**
3	Wilmington Ave/223rd St	0.643	-	B	0.690	-	B	0.653	-	B	0.696	-	B	0.010	0.006	No
4	Alameda St./Interstate 405 NB Ramps	0.690	21.2	C	0.665	23.2	C	0.807	25.6	C	0.683	23.8	C	4.4 s	0.6 s	No
5	Alameda St./223rd St (along Alameda St.)	0.460	-	A	0.570	-	A	0.484	-	A	0.604	-	B	0.024	0.034	No
6	Alameda St./223rd St (along 223rd St)	0.349	-	A	0.634	-	B	0.358	-	A	0.696	-	B	0.009	0.062	No
7	Alameda St./Sepulveda Blvd (along Alameda St.)	0.374	-	A	0.537	-	A	0.406	-	A	0.552	-	A	0.032	0.015	No
8	Alameda St./Sepulveda Blvd (along Sepulveda Blvd)	0.415	-	A	0.742	-	C	0.452	-	A	0.751	-	C	0.037	0.009	No
9	Interstate 405 SB Ramps/223rd St	0.472	23.4	C	0.327	24.3	C	0.502	24.6	C	0.395	23.7	C	1.2 s	-0.6 s	No
10	Terminal Island Fwy (SR-103)/Sepulveda Blvd	0.390	-	A	0.579	-	A	0.421	-	A	0.595	-	A	0.031	0.016	No
11	Santa Fe Ave/Sepulveda Blvd	0.624	-	B	0.781	-	C	0.654	-	C	0.798	-	C	0.030	0.017	No
12	Interstate 710 SB Ramps/Willow St	Uncontrolled Intersection														No
13	Interstate 710 NB Ramps/Willow St	Uncontrolled Intersection														No

(a) = Significant temporary impact based on LOS E operation with the addition of construction-related trips.
Notes:
V/C = Volume to Capacity Ratio, LOS = Level of Service, Delay = Average Vehicle Delay (Seconds), s = seconds

The construction of the Interstate 405/Wilmington Avenue Interchange will have periodic lane and ramp closures that, while temporary, has the potential to affect the proposed project-related construction trips' interaction with the roadway network and demand placed on study intersections. This analysis includes the construction period analysis of the proposed project at the beginning of the construction of the Interstate 405/Wilmington Avenue Interchange (baseline conditions) in its pre-construction configuration in Table 4.7-3.

As shown in Table 4.7-3, the LOS at all intersections is expected to be LOS A, B or C, except Interstate 405/Wilmington Avenue Southbound Ramps during the morning peak hour. The construction-related trips are forecast to result in a significant impact during construction of the proposed project at the Interstate 405/Wilmington Avenue Southbound Ramps under their pre-construction configuration of the freeway ramps. This is due to the large number of project-related trips utilizing the southbound ramp to access the proposed project site in the a.m. peak hour.

It should be emphasized that the significant adverse impacts at the Interstate 405/Wilmington Avenue Southbound Ramps during the morning peak hour are temporary in nature and terminate once construction of the interchange has been completed, which is expected to occur early 2016. The analysis indicates that inbound trips to the proposed project during the construction period should avoid the Interstate 405/Wilmington Avenue interchange while it is under construction. Once the construction phase of the proposed project is completed, potential traffic impacts at the Interstate 405/Wilmington Avenue interchange would no longer be significant and, therefore, mitigation by the applicant would no longer be required.

The proposed project is not expected to conflict with applicable policies, plans or programs as the increase in traffic is limited to the construction period, traffic impacts will be temporary, and traffic impacts will cease following peak construction activities. Construction activities would not require the closure of any major roadway for any period of time as all construction activities will occur within the confines of the existing Refinery, with the exception of the Interconnecting Pipelines. The portion of the Interconnecting Pipeline that is outside of the Refinery boundaries will be bored underneath Alameda Street and Sepulveda Boulevard. Therefore, no road closures are expected due to the construction of the proposed project.

Finally, construction activities will increase the demand for parking as an estimated 950 construction workers would be required during peak construction activities. As shown on Figure 2-19, sufficient parking for the construction workers exists within and adjacent to the existing Refinery. Therefore, no significant impact due to increase parking is associated with construction of the proposed project. Following construction, no increase in the number of workers required to operate the Refinery is expected. Therefore, there would be no long-term parking impacts associated with the proposed project.

4.7.3 MITIGATION MEASURES

Mitigation measures are required in order to reduce the proposed project's construction-related trips on the Interstate 405/Wilmington Avenue Southbound Ramps intersection prior to the

completion of the Interstate 405/Wilmington Avenue Interchange project. Therefore, the following mitigation measure will be imposed.

TT-1: The applicant will be required to implement a traffic management plan to address significant adverse construction traffic impacts generated by the proposed project prior to the completion of the improvements at the Interstate 405/Wilmington Avenue Southbound Ramps intersection. The traffic plan will require that project workers be advised of the construction schedule and potential restrictions and closures associated with the Interstate 405/Wilmington Ave. Interchange project and will be required to avoid the Interstate 405/Wilmington Avenue Southbound Ramps intersection during morning peak travel periods by traveling either outside of the morning peak travel time or along alternative routes. Additionally, construction workers shall be encouraged to participate in ridesharing to lessen the number of vehicles transiting to the Refinery. The protocols for the dissemination of information to proposed project workers and potential alternative schedules or routing during construction activities for the proposed project will be provided in the traffic management plan. The requirement to avoid the Interstate 405/Wilmington Avenue Southbound Ramps intersection will be included as a provision in the construction contracts of all construction contractors.

As shown in Table 4.7-3, traffic conditions with the proposed project at all other study locations are expected to be rated LOS C or better during peak a.m. and p.m. traffic hours. As a result, it is anticipated that using the most likely alternative routes to the Refinery during the peak construction phase for the proposed project will not create significant adverse traffic impacts at the alternative route intersections.

4.7.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The impacts of the proposed project on traffic and circulation are expected to be less than significant following implementation of mitigation measure TT-1 because most, if not all, construction worker trips will be required to avoid the Interstate 405/Wilmington Avenue Southbound Ramps intersection while it is under construction.

4.8 SIGNIFICANT AND UNAVOIDABLE ADVERSE IMPACTS

CEQA requires an EIR to discuss significant environmental effects (CEQA Guidelines §15126.2(b)) and irreversible environmental changes (CEQA Guidelines §15126.2(c)), which would result from a proposed project, should it be implemented. Significant environmental impacts are impacts that would exceed established significance threshold levels (e.g., air pollutant emissions during proposed project construction would exceed SCAQMD established significance threshold levels and remain significant after implementing mitigation measures). Irreversible changes include a large commitment of nonrenewable resources, committing future generations to specific uses of the environment (e.g., converting open spaces into urban development), or enduring environmental damage due to an accident.

It was determined that implementation of the proposed project would result in potentially significant adverse VOC and NOx impacts on air quality during construction and exceed the localized significance thresholds for NO_2 during construction. Significant construction emissions are temporary and will cease following completion of construction activities. Operational air quality impacts of criteria pollutants will be a beneficial reduction for CO, and less than significant impacts for VOC, NOx, SOx, PM10, PM2.5 and and TACs, and thus are not expected to have a significant adverse impact on the environment. Following completion of the construction phase, the proposed project is expected to result in a local benefit to air quality. Therefore, the proposed project is not expected to have long-term adverse environmental impacts on air quality.

The proposed project could result in significant adverse hazard impacts related to "worst case" accidental releases of hazardous materials associated with the proposed modifications to the Naphtha Isomerization Unit, the proposed new crude tanks, SARP, and Interconnecting Pipelines. Compliance with existing PSM, RMP, and CalARP regulations and compliance with the mitigation measure imposed would minimize the potential impacts associated with a release, but are not expected to eliminate the potentially significant adverse hazard impacts.

Traffic levels are expected to increase during the construction phase and generate potentially significant adverse traffic impacts. Feasible mitigation measures were identified and are expected to reduce significant adverse traffic impacts to less than significant. Since the proposed project is not expected to require new employees, operational traffic levels are expected to remain essentially the same as existing levels. Therefore, no significant adverse impacts for traffic are expected during operation of the proposed project.

The proposed project involves modifications to an existing Refinery, located within an industrial area, which has been operating since the early 1900s. Therefore, since the Refinery would continue to refine crude oil into useful, marketable products there will be no major commitment of nonrenewable resources or changes that would commit future generations to specific uses of the environment associated with the proposed project.

4.9 GROWTH INDUCING IMPACTS

4.9.1 INTRODUCTION

CEQA defines growth-inducing impacts as those impacts of a proposed project that "could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects, which would remove obstacles to population growth" (CEQA Guidelines §15126.2(d)).

To address this issue, potential growth-inducing effects are examined through the following considerations:

- Facilitation of economic effects that could result in other activities that could significantly affect the environment;
- Expansion requirements for one or more public services to maintain desired levels of service as a result of the proposed project;
- Removal of obstacles to growth, e.g., through the construction or extension of major infrastructure facilities that do not presently exist in the project area or through changes in existing regulations pertaining to land development;
- Adding development or encroachment into open space; and/or
- Setting a precedent that could encourage and facilitate other activities that could significantly affect the environment.

4.9.2 ECONOMIC AND POPULATION GROWTH, AND RELATED PUBLIC SERVICES

The proposed project would not directly or indirectly foster economic or population growth or the construction of new housing in the southern California area. Although the proposed project involves a construction project within an existing industrial area, it would not directly or indirectly stimulate substantial population growth, remove obstacles to population growth, or necessitate the construction of new community facilities that would lead to additional growth in the surrounding area.

A project would directly induce growth if it would directly foster economic or population growth or the construction of new housing in the surrounding environment (e.g., if it would remove an obstacle to growth by expanding existing infrastructure). The proposed project would not remove barriers to population growth, as it involves no changes to General Plan, zoning ordinance, or related land use policy. The proposed project does not include the development of new housing or population-generating uses or infrastructure that would directly encourage such uses. The residential areas in the immediate vicinity of the proposed project (Carson,

Wilmington and Long Beach) are built out. Therefore, the proposed project would not directly trigger new residential development in the area.

The proposed project would temporarily contribute to regional employment, requiring employees for construction activities at the Refinery. The construction work force is expected to require a maximum of 696 construction workers. It is expected that construction workers will be largely drawn from the existing workforce pool in southern California. Considering the existing workforce in the region (over five million workers) and current unemployment rates (about 5.9 percent) (EDD 2016), it is expected that a sufficient number of workers are available locally and that few or no workers would relocate for temporary construction jobs created by the proposed project.

Operation of the proposed project is not expected to create any additional jobs, as it involves the modifications to the Tesoro Los Angeles Refinery to more fully integrate the Wilmington Operations and Carson Operations. Further, the proposed project would not be expected to result in an increase in local population, housing, or associated public services (e.g. fire, police, schools, recreation, and library facilities) since no increase in the permanent number of Refinery workers is expected. Likewise, the proposed project would not create new demand for secondary services, including regional or specialty retail, restaurant or food delivery, recreation, or entertainment uses. As discussed in the NOP/IS (see Appendix A), implementation of the proposed project would not increase the demand for wastewater treatment facilities, electricity, solid waste disposal capacity, or natural gas. As such, the proposed project would not foster economic or population growth in the surrounding area in a manner that would be growth-inducing.

4.9.3 REMOVAL OF OBSTACLES TO GROWTH

The proposed project is located within an existing Refinery where adequate infrastructure is already in place to serve the existing Refinery and existing surrounding population. The proposed project would more fully integrate the Wilmington Operations and Carson Operations to more efficiently operate the Tesoro Los Angeles Refinery. As such, the proposed project would help ensure the continued reliable supply of petroleum products in an area that historically has been used for refinery and other related operations. The proposed project could result in an increase in the import or refining of about 6,000 bbl/day of crude oil, but would not result in a substantial increase in the production of petroleum products (e.g., gasoline and diesel fuels) to allow significant population growth.

The proposed project would not employ activities or uses that would result in growth inducement, such as the development of new infrastructure (e.g., new roadway access or utilities) that would directly or indirectly cause the growth of new populations, communities, or currently undeveloped areas. Likewise, the proposed project would not result in an expansion of existing public service facilities (e.g., police, fire, libraries, and schools) or the development of public service facilities that do not already exist.

4.9.4 DEVELOPMENT OR ENCROACHMENTS INTO OPEN SPACE

Development can be considered growth-inducing when it is not contiguous to existing urban development and introduces development into open space areas. The proposed project is situated within an existing Refinery in a heavy industrial, urbanized area that is currently developed. The proposed project would not result in development within or encroachment into an open space area.

4.9.5 PRECEDENT SETTING ACTION

The proposed project will require permits and other regulatory approvals from state, federal, and local agencies. For construction and operation of the proposed project, permits and approvals from a number of agencies are required including: (1) a Title V permit issued by the SCAQMD; (2) permits to construct/operate from the SCAQMD; (3) CalOSHA construction-related permits; (4) encroachment permits from the Alameda Corridor Transportation Authority; (5) building and related permits from the Cities of Carson and Los Angeles; and (6) conditional use permit from the City of Carson for the new crude tanks. These required approvals are routine permit actions and would not result in precedent-setting actions that might cause significant environmental impacts beyond what was evaluated in this EIR.

4.9.6 CONCLUSION

The proposed project would help ensure the efficient manufacture of petroleum products at an existing Refinery that has been used for refining purposes since the early 1900s. As a development project occurring in an urban, industrialized, and generally built-out environment, the proposed project would increase long-term stability and the availability of petroleum products. However, the proposed project would not be considered growth-inducing, because it would not result in an increase in production of resources or cause a progression of growth that could significantly affect the environment either individually or cumulatively.

4.10 ENVIRONMENTAL EFFECTS FOUND NOT TO BE SIGNIFICANT

The environmental effects of the proposed project that may have potentially significant adverse effects on the environment are identified, evaluated, and discussed in detail in the preceding portions of Chapter 4 of this EIR and in the Initial Study (see Appendix A) per the requirements of the CEQA Guidelines (§§15126(a) and 15126.2). The potentially significant adverse environmental impacts as determined by the Initial Study (see Appendix A) include: air quality and greenhouse gas emissions; hazards and hazardous materials; hydrology and water quality; noise; solid and hazardous waste; and transportation and traffic. The analysis provided in the Initial Study has concluded that the following environmental topics would be less than significant: aesthetics; agriculture and forestry resources, biological resources, cultural resources; energy; geology and soils; land use and planning; mineral resources; population and housing; public services and recreation.

The reasons for finding the environmental resources to be less than significant are explained below. No comments were received on the NOP/IS that disputed the conclusions that the impacts from the proposed project discussed in this section would be less than significant.

4.10.1 AESTHETICS

The proposed project will be located in the Wilmington District of the City of Los Angeles and the southeastern portion of the City of Carson within Los Angeles County. The proposed project is located in an existing industrial facility. The proposed project site currently consists of the Refinery (which includes both the Wilmington and Carson Operations), as well as a sulfur recovery plant and crude storage terminal. Except for pipeline and electrical intertie construction, all project activities are expected to take place within the boundaries of the proposed project site.

The area of the proposed project is zoned as an industrial area. Once completed, the proposed project configuration will not appear substantially different than the existing Refinery configuration that is currently located at the proposed project site. There are no scenic vistas in the vicinity of the proposed project. Therefore, the proposed project will not change any scenic vistas. No scenic resources are present within the existing facilities. Therefore, the proposed project will not have substantial adverse effects on scenic vistas or scenic resources.

New structures at the Wilmington Operations would range in height from about 70 to 125 feet tall and will be located within the operating portions of the existing Refinery. Within the confines of the Wilmington Operations, other nearby existing structures which are not part of the proposed project range from 90 to 150 feet tall. New structures at the Carson Operations would range in height from about 40 to 120 feet tall. Within the confines of the Carson Operations, other nearby existing structures which are not part of the proposed project range from about 50 to 180 feet tall. Although the proposed project includes some structures that are higher than existing adjacent units, the overall visual characteristics of the integrated Refinery are expected to be the same or similar to the existing configuration at the Refinery. Further, installation of

new or replacement of existing equipment at the facility, either inside or outside the existing structures, would not appreciably change the visual profile of the entire facility.

In general, construction activities for the proposed project are not anticipated to require additional lighting because they are scheduled to take place primarily during daylight hours. However, when daylight hours are limited (i.e., winter months), or during Refinery turnarounds (when construction activities could occur 24-hours per day), temporary lighting may be required. Any additional lighting would be focused on the construction area and aimed toward the Refinery operations. Since the proposed project would be located within the boundaries of the existing Refinery, additional temporary lighting, if needed, is not expected to be discernible from the existing permanent night lighting already associated with Refinery operations.

New permanent lighting may be provided as necessary in accordance with applicable safety standards on new structures constructed as a result of the proposed project. If any new lighting is installed, it is expected to be consistent with existing lighting at the Refinery, and, therefore, not noticeable outside the integrated Refinery boundaries.

4.10.2 AGRICULTURE AND FORESTRY RESOURCES

Except for the Interconnecting Pipelines and electrical intertie construction, the proposed project would not involve construction or operation outside of the existing boundaries of the integrated Refinery. The proposed project would be consistent with the heavy industrial zoning requirements for the integrated Refinery and the Carson Crude Terminal. No agricultural or forestry resources or operations, including Williamson Act contracts, are located within or near the boundaries of the Wilmington or Carson Operations. No agriculture or forestry resources would be adversely affected by construction or operation activities from the proposed project because it would be implemented within the existing Refinery or other adjacent industrial areas (e.g., Alameda Corridor) and adjacent industrial areas that support Carson and Wilmington Operations and do not include agricultural resources. Therefore, the proposed project would not result in any new construction of buildings or other structures that would convert farmland to non-agricultural use or conflict with zoning for agricultural use or a Williamson Act contract.

Since the proposed project would occur within or immediately adjacent to the boundaries of the Wilmington and Carson Operations, there are no provisions of the proposed project that would affect land use plans, policies, or regulations related to agricultural or forestry resources. Land use and other planning considerations are determined by local governments and no land use or planning requirements relative to agricultural resources will be altered by the proposed project. For these same reasons, the proposed project would not result in the loss of forest land or conversion of forest land to non-forest use.

4.10.3 BIOLOGICAL RESOURCES

The proposed project would be located in a heavy industrial zoned area and, with the exception of the Interconnecting Pipelines and electrical intertie construction, would be within the boundaries of the existing Refinery. The facilities and surrounding areas have been fully developed and are essentially devoid of vegetation and wildlife. Vegetation on-site or near each

affected area has been eliminated for fire prevention purposes with the exception of landscape vegetation near the administration buildings. Because there is no native vegetation in the vicinity of the proposed project, project construction activities would not impact rare, endangered, or threatened species. The proposed pipeline will be tunneled under existing streets which are devoid of vegetation. The proposed project would not adversely affect federally protected wetlands as defined in §404 of the Clean Water Act, as none are located within the proposed project area. Therefore, no significant adverse impacts on biological resources are expected.

4.10.4 CULTURAL RESOURCES

The buildings, structures, and equipment associated with the proposed project are not listed on registers of historic resources, and do not meet any of the eligibility criteria as cultural resources (e.g., associated with historically important events or people, embodying distinctive characteristics of a type, period, or method of construction), and would not be likely to yield historically important information. The only components of the proposed project that are being removed are old Refinery structures including columns, fans, towers, heat exchangers, pumps, etc. None of these structures meet historical significance criteria. Therefore, no significant adverse impacts to historic cultural resources are expected as a result of implementing the proposed project.

The entire active portions of the Wilmington and Carson Operations have been previously graded and developed. Proposed project activities will occur in areas of the integrated Refinery and Carson Crude Terminal where the ground surface has already been disturbed, within or adjacent to existing refining and other units, and this past disturbance reduces the likelihood that previously unknown cultural resources will be encountered. Further, the Refinery site does not contain known paleontological resources and thus the proposed project also is not expected to impact any sites of paleontological value. However, as required by State law, if human remains are unearthed, no further disturbance will occur until the County Coroner has made the necessary findings concerning the origin and disposition of these remains. The Native American Heritage Commission will be notified if the remains are determined to be of Native American descent.

The proposed project will not cause significant adverse impacts to cultural resources; therefore, impacts on cultural resources are expected to be less than significant.

4.10.5 ENERGY

4.10.5.1 Electricity

The proposed project is not expected to conflict with any adopted energy conservation plan or existing energy standard. There are no known energy conservation plans or existing energy standards that would apply to either of the existing Wilmington and Carson Operations or the proposed project as it primarily involves new and modified equipment that will allow the Refinery to operate more efficiently. The FCCU at Wilmington Operations will be shut down, reducing the energy requirements in this portion of the integrated Refinery. Heat exchangers

will be added to a number of units to increase overall energy recovery efficiency. The potential additional energy demand that may be needed to implement proposed project construction and operational activities was determined to be less than significant in the NOP/IS and no public comments disputed this conclusion.

Since completion of the NOP/IS additional engineering design and information has been completed and there is a better understanding of the proposed project's electricity requirements. Table 4.10-1 provides estimates of the electricity requirements associated with the proposed project and augments information provided in the NOP/IS (see Table 4.10-1.)

As shown in Table 4.10-1, the proposed project would result in an increase in horsepower associated with new/modified equipment and, therefore, result in an increase in electricity requirements at the Carson Operations. Electricity for the Carson Operations is provided by the existing Watson Cogeneration Facility. The Watson Cogeneration Facility currently produces excess electricity that it sells to Southern California Edison. Under the proposed project, the amount of electricity that would be sold would be reduced and used to provide the electricity requirements associated with the proposed project. Therefore, as concluded in the NOP/IS, no significant adverse impacts on electricity production would be expected due to operation of the proposed project.

TABLE 4.10-1

Proposed Project Electricity Use

Unit	Equipment	Motor Horsepower	Spare Motor Horsepower[(a)]
Direct Components			
Wilmington FCCU Shutdown	C-142 Shutdown	-6,500	
Wilmington FCCU Shutdown	Precipitators Shutdown	-1,300	
Wilmington HCU – 1st Stage	Charge Pump – Additional Motor	250	
Wilmington HCU – 1st Stage	Fractionator Bottom Pumps	200	
Wilmington HCU – 1st Stage	Booster Pump	12	
Wilmington HTU-4 Heat Integration	DGO Booster Pumps	150	150
Wilmington HTU-1	Booster Pump	100	100
SARP	Main Compressor	1,200	1,200
SARP	Blower	215	80
SARP	Pumps	350	140
SARP	Air Coolers	150	
SARP	Miscellaneous	100	50
Wilmington 300M Crude Storage Tanks	Mixers	120	

TABLE 4.10-1(concluded)

Unit	Equipment	Motor Horsepower	Spare Motor Horsepower[(a)]
Wilmington 300M Crude Storage Tanks	Crude Booster Pump	450	
Wilmington PSTU	Pumps	223	203
Carson Stabilizer Reboiler	Jet Cut Tower Bottoms Pumps	10	10
Carson NHDS	Feed Pump	300	
Carson NHDS	Reflux Pumps	60	
Carson NHDS	Bottom Pumps	100	100
Carson No.51 Vacuum Unit	Diesel Product Pumps	600	
Carson Alkylation Unit	Current Pumps	-15	-15
Carson Alkylation Unit	New Pumps	50	50
Carson Hydrocracker	BUX Air Cooler	20	
Carson Steam Production	No.2 Crude Unit Charge Pump	600	
Carson Steam Production	No.7 Cooling Tower Pump	500	
Carson Steam Production	No.9 Cooling Tower Pump	750	
Carson LPG Railcar Unloading	Unloading Pumps	50	
Carson Wet Jet Treater	Pumps	200	200
Carson Crude Crude Tanks	500M Tanks Mixers	720	
Carson Crude Crude Tanks	Transfer Pumps	450	
Interconnecting Pipelines	Line 4 – Transfer Pump (W)	100	
	Line 7 – Propylene (C)	40	40
Subtotal, Direct Components		**255**	**2,308**
	Indirect Components		
H-100 Downstream Impacts	Various equipment	1,428	--
Subtotal, Indirect Components		**1,428**	--
TOTAL PROPOSED PROJECT		**1,683**	**2,308**

(a) Some modifications include the installation of spare equipment. If the main equipment fails, the spare equipment would take over operations. Note that the main equipment and spare equipment would not operate at the same time.

4.10.5.2 Fuels

With the exception of electric welders, compressors and distribution panels for tools, it is not expected that natural gas-fired or electrically-powered construction equipment would be used; thus, there would be no need for new or substantially altered power or natural gas utility systems during construction of the proposed project. As evaluated in the NOP/IS, construction of the proposed project is estimated to require about 64,000 gallons of diesel fuel per year. In 2011, the Los Angeles region used 4,892 million gallons of gasoline and 281 million gallons of diesel. The fuel associated with construction of the entire project represents less than one percent of the total annual demand in the Los Angeles region, is a negligible fraction of the total use of fuel in California, and is not considered to be a wasteful use of fuel. The construction activities are not

expected to result in an increase in gasoline consumption as the construction equipment is predominately diesel fueled. Therefore, less than significant adverse energy impacts are expected during the construction period. Additionally, no permanent employees are anticipated to be needed to operate the Refinery once construction is completed, so no additional demand for gasoline fuel is expected.

No significant adverse impacts to energy resources are expected to occur as a result of construction and operational activities that Tesoro would undertake in order to complete the proposed project. Similarly, the proposed project would not utilize non-renewable energy resources in a wasteful or inefficient manner. Therefore, no potentially significant adverse energy impacts were identified.

4.10.6 GEOLOGY AND SOILS

The proposed project is located within a seismically active region. The most significant potential geologic hazard is estimated to be seismic shaking from future earthquakes generated by active or potentially active faults in the region. Past experience indicates that there has not been any substantial damage, structural or otherwise to the Wilmington and Carson Operations as a result of earthquakes.

No faults or fault-related features are known to exist at the Refinery. The closest fault zone to the Refinery is the Newport-Inglewood Fault Zone, which is located approximately 1.5 to 2.0 miles northeast of the Refinery. The proposed project is not located on any Alquist-Priolo Earthquake fault zone and is not expected to be subject to significant surface fault displacement. Therefore, no significant adverse impacts to the proposed project facilities are expected from seismically-induced ground rupture.

The new and modified equipment must be designed to comply with the California Building Code requirements since the proposed project is located in a seismically active area. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The California Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes.

The new and modified equipment at the Refinery will require building permits, as applicable, for all new structures associated with the proposed project from the City of Los Angeles and the City of Carson. The issuance of building permits from the local authority will assure compliance with the California Building Code requirements which include requirements for building within seismic hazard zones. No significant adverse impacts from seismic hazards are expected since the proposed project will be required to comply with the California Building Codes, including those addressing seismic effects.

Thus, the proposed project would not alter the exposure of people or property to geological hazards such as earthquakes, landslides, mudslides, ground failure, or other natural hazards. As a result, substantial exposure of people or structures to the risk of loss, injury, or death involving

the rupture of an earthquake fault, seismic ground shaking, ground failure or landslides is not anticipated.

4.10.7 LAND USE AND PLANNING

The construction and operation of the proposed project will occur primarily within the confines of the existing Wilmington and Carson Operations, except for the Interconnecting Pipelines and electrical intertie construction, which would be routed underneath Alameda Street and Sepulveda Boulevard and the electrical conduit that would be routed over Alameda Street. As a result, no component of the proposed project would result in physically dividing any established communities, but will continue the use of the site as a Refinery.

All land uses in the vicinity of the proposed project are existing industrial areas, which are zoned for heavy industrial use. The proposed project is consistent with the heavy industrial land use designation of the Refinery and no land use or planning requirements will be altered by adoption of the proposed project. Therefore, present or planned land uses in the region will not be affected as a result of the proposed project. Based upon the above considerations, significant adverse land use planning impacts are not expected from the implementation of the proposed project.

4.10.8 MINERAL RESOURCES

Construction and operation of the proposed project would occur entirely within the boundaries of the existing Refinery and adjacent industrial areas, all of which are zoned heavy industrial. The California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) keeps records of oil wells and oil fields in California. According to the DOGGR online data, there are no oil wells (active or abandoned) located within the confines of the proposed project. The nearest oil and gas wells are located adjacent to the southwestern property line and are either idle or abandoned wells in the Wilmington Oil Field. Thus, the proposed project would not affect the availability of known crude oil or other mineral resources (no other known mineral resources are expected to be required for the proposed project).

There are no provisions of the proposed project that would result in the loss of availability of a known mineral resource of value to the region and the residents of the State of California such as aggregate, coal, clay, shale, etc., or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

4.10.9 POPULATION AND HOUSING

Construction and operational activities associated with the proposed project are not expected to involve the relocation of individuals, adversely impact housing or commercial facilities, or change the distribution of the population in the region because the proposed project will occur completely within existing industrial facilities and no housing is located within the industrial areas. It is estimated that as many as 696 construction workers are expected to be needed during peak construction activities and most of the workers are expected to come from the large labor

pool in southern California (over five million workers). No increase in the permanent number of workers at the Tesoro Los Angeles Refinery is expected following the construction phase. Human population within the jurisdiction of the SCAQMD is anticipated to grow regardless of implementing the proposed project. As a result, the proposed project is not anticipated to generate any significant adverse effects, either direct or indirect, on population growth or distribution within the district.

Operation of the proposed project is not expected to require additional workers. As a result, the proposed project is not expected to result in the creation of any industry that would affect population growth, directly or indirectly induce the construction of single- or multiple-family units, or require the displacement of people or housing elsewhere in the district.

4.10.10 PUBLIC SERVICES

To respond to emergency situations, both the Wilmington and Carson Operations maintain on-site fire departments, which are supplemented by the resources of public fire departments. Both Operations are supported by the Los Angeles County Fire Department (LACFD) and City of Los Angeles Fire Department (City Fire). There are four LACFD stations (all located within the City of Carson) and one City Fire station in Wilmington that serve the proposed project area.

During construction, monitoring for hazards with equipment designed to detect sources of flammable gases and vapors, written procedures, training, and authorization of equipment used on-site will be in place. Construction activities are not expected to result in an increased need for fire response services or affect service ratios or other performance objectives.

Both the Wilmington and Carson Operations maintain their own emergency response teams to respond to emergencies. Each Operation maintains fully trained 24-hour emergency response team and equipment to protect against flammable and combustible materials. The proposed project is not expected to increase the need or demand for additional services from the fire department above current levels because on-site firefighting and emergency response capabilities and personnel will be maintained and are expected to be able to continue to respond to potential emergencies in the future, while maintaining acceptable service ratios, response times, or other performance objectives.

The Los Angeles City Police Department and the Los Angeles County Sheriff's Department are the responding agencies for law enforcement needs in the vicinity of the Wilmington and Carson Operations. Because the sheriff and police departments typically have units that are in the field, response times to the Refinery currently vary depending on the location of the nearest unit.

The existing Wilmington and Carson Operations have security departments that provide 24-hour protective services for people and property within the fenced boundaries of each facility. The proposed project is not expected to require additional staffing at the security department as the security needs at the integrated Refinery are not expected to change. Thus, no additional or altered police protection would be required for the proposed project once it becomes operational.

As previously discussed in Section 4.10.9, the proposed project is not expected to induce population growth in any way. The existing labor pool in southern California is expected to be sufficient to fulfill the labor requirements for construction of the proposed project. During construction there would be no increase in the local population so no adverse impacts would be expected to local schools or other public facilities. Similarly, once the proposed project becomes operational, the integrated Refinery is not expected to require additional permanent staffing to operate new equipment, so an increase in the local population that could adversely affect local schools or other public facilities is not expected. There would be no increase in population and, therefore, there would be no need for physically altered government facilities.

4.10.11 RECREATION

Parks in the vicinity of the Wilmington and Carson Operations include Silverado, Hudson, and Admiral Kidd Parks in Long Beach; East Wilmington Vest Pocket, East Wilmington Greenbelt, and Banning Parks in Wilmington; and Calas and Friendship Mini-Park in Carson.

The existing labor pool in southern California is sufficient to fulfill the labor requirements for the construction of the proposed project. The operation of the proposed project would not require additional permanent workers to be hired at the Refinery and, therefore, there would be no significant changes in population densities or distribution resulting from the proposed project and, thus, no increase in the use of existing neighborhood and regional parks or other recreational facilities.

Because the proposed project is limited to the confines of the existing industrial facilities and will not result in additional employees during operation, the proposed project would not increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or expansion of existing recreational facilities that might have an adverse physical effect on the environment because it would not directly or indirectly increase or redistribute population.