

## **CHAPTER 5**

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### **CUMULATIVE IMPACTS**

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## 5.0 CUMULATIVE IMPACTS

### 5.1 INTRODUCTION

CEQA Guideline §15130(a) requires an EIR to discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in §15065(a)(3). There are a number of projects proposed for development in the vicinity of the Refinery, which may contribute cumulative impacts to those generated by the proposed PRO Project. These include other refinery and industrial projects, and projects planned in the Cities of El Segundo and Manhattan Beach. Figure 5-1 shows the locations of the cumulative projects. The discussion below lists projects which are reasonably expected to proceed in the foreseeable future, i.e., project information has been submitted to a public agency. Cumulative construction impacts were evaluated herein if the major portion of construction is expected to occur during the same construction period as the Chevron PRO Project.

Public agencies were contacted to obtain information on projects within the El Segundo and Manhattan Beach areas. As part of the cumulative impact analysis, the SCAQMD typically includes projects within about a one mile of the proposed project. Figure 5-1 identifies by number the location of each of the projects discussed below. The numbers are used to identify the related projects throughout the discussion of cumulative impacts. Local impacts were assumed to include projects which would occur within the same timeframe as the Chevron PRO Project and which are within a one-mile radius of the Refinery site. These projects generally include other refinery projects and projects in near-by cities. A number of construction projects are proposed at the LAX. Although the Chevron El Segundo Refinery is located south of LAX, the proposed projects at LAX are located about two miles away and outside of the scope of the cumulative analysis for this EIR. Further, because of the distance no overlap in related impacts is expected. For example, the projects are separated by about two miles so that construction traffic associated with the Chevron proposed PRO Project is expected to remain south of the I-105 Freeway, while the traffic associated with the LAX projects would remain north of the I-105 Freeway, thereby affecting different intersections. Construction impacts on air quality are generally localized and there is sufficient distance between projects located over one mile away from the Refinery to avoid cumulative impacts.

Some of the resources affected by the proposed Chevron Refinery project would primarily occur during the construction phase, e.g., traffic. Other impacts would primarily occur during the operational phase, e.g., hazards. Still other impacts would occur during both phases, e.g., air quality and noise.



CHEVRON EL SEGUNDO REFINERY  
Cumulative Project Locations

Figure 5-1



### 5.1.1 RELATED PROJECTS

Proposed projects within the general El Segundo/Manhattan Beach area that could contribute to cumulative impacts are described below.

#### 5.1.1.1 Sepulveda/Rosecrans Site Rezoning and Plaza El Segundo Development (#1)

The proposed Sepulveda/Rosecrans Site Rezoning would encompass a change in the City of El Segundo's General Plan land use designation for, and rezoning of, approximately 70.8 acres of an approximate 110 gross-acre site located at the northeastern corner of the intersection of Sepulveda Boulevard and Rosecrans Avenue. The Plaza El Segundo project is a proposed retail center that would implement the amended General Plan land use designation and new zoning designation within a portion of the proposed Sepulveda/Rosecrans Rezoning Site. The proposed Sepulveda/Rosecrans rezoning would permit up to 850,000 square feet of commercial development within the site. Approximately 20.4 gross acres would retain their current Light Industrial zoning and 3.8 acres would remain Heavy Industrial. The Plaza El Segundo development would consist of approximately 43.3 gross acres of retail space and is located adjacent to the southeast corner of the Refinery. The shopping center would contain large retail stores, specialty retail, and other uses such as a fitness center/spa and restaurants (both fast food and sit down). This is the closest major project to the Refinery. Because of its size and its proximity to the proposed project, it is likely that it would have the greatest potential to generate cumulative impacts. Therefore, environmental impacts from the Plaza El Segundo project were evaluated in detail in the cumulative impacts analysis for the proposed project.

#### 5.1.1.2 El Segundo Power Plant Project (#2)

El Segundo Power II LLC is proposing to replace the existing El Segundo Generating Station Units 1 and 2 with a natural gas-fired combined cycle electric generation facility. The project is located at 301 Vista Del Mar, El Segundo and consists of approximately 33 acres. This site is adjacent to the northwest corner of the Chevron Refinery.

The new combined cycle facility would generate approximately 291 megawatts more than the old units were capable of generating. The project will use SCR, a dry, low NOx combustor and an oxidation catalyst system to reduce emissions. The project will not require new off-site transmission lines or natural gas pipelines. The new units will use the existing seawater cooling system without modifying the intake or outfall structures and lines, and without modifying the flow rates and capacity. New pipelines include two water supply lines occupying a single trench in El Segundo city streets and a sanitary discharge pipeline within Manhattan Beach City streets. An ammonia pipeline will be installed in the adjacent Chevron marine terminal property to deliver ammonia to the site for SCR. This project has not yet been constructed and is on hold. In order to provide a

conservative (“worst-case”) estimate of cumulative impacts, construction activities will be assumed to occur concurrently with the Chevron PRO Project.

#### **5.1.1.3 L.A. Air Force Base Projects– Area A (#3) & Area B (#4)**

The Air Force has pursued an innovative business practice as a means of upgrading facilities on Los Angeles Air Force Base (LAAFB), known as the Systems Acquisition Management Support (SAMS) Complex. This project involved trading government-owned land in the Los Angeles area in exchange for the design and construction of new facilities at LAAFB. The Fiscal Year 2001 Defense Authorization Act allows the Air Force to transfer portions of the base to a private developer in exchange for construction of new seismically stable facilities that will better protect the LAAFB workforce and promote efficiency in operations.

The areas of LAAFB affected by this project are situated on four parcels totaling about 113 acres and located one mile south of LAX. Two of these projects are located within one mile of the Chevron Refinery. LAAFB is the home of the Space and Missile Systems Center (SMC), a research, development and contracting organization of the United States Air Force. LAAFB has no airfield, nor any flight operations capability or requirement.

- Area A: about 42 acres located at 2400 East El Segundo Blvd. in El Segundo, CA; consists of six two-story and one six-story office buildings totaling about 835,000 square feet; much of Area A is landscaped with many large shade trees creating a campus-like setting.
- Area B: about 52 acres located near Area A at the intersection of El Segundo Blvd and Douglas Avenue (west of Aviation Blvd.) in El Segundo; contains facilities for support of Air Force personnel assigned to SMC, as well as support of military retirees. Area B houses base support functions such as the 61st Air Base Group headquarters, Medical Clinic, Base Exchange and Commissary. Area B is also the designated location of the SAMS Complex.
- The Lawndale Annex 3 and Sun Valley Properties are located outside the one-mile radius of the Chevron Refinery and will not be considered in this cumulative evaluation.

The Air Force will move all government workers to Area B, freeing up Area A, Annex 3 and Sun Valley to be transferred to a developer for private development. The outdated facilities and buildings occupied by the Air Force at Area A and Annex 3 do not meet current fire codes or seismic standards. These buildings have been or are in the process of being replaced at a reconfigured Area B with approximately 560,000 square feet of new administrative and special purpose facilities. The project allows the Air Force to dispose up to 865,000 square feet of substandard buildings and occupy a modern and efficient complex. The concept could eliminate a requirement for 130 to 150 million dollars in military construction projects. It is also estimated that right-sizing LAAFB will save over three million dollars annually in operations and maintenance costs. The Air

Force also wishes to minimize disruption of its workers currently located on those portions of LAAFB that would be provided for private development. Therefore, demolition of these structures has been and will continue to be coordinated with new private developments so the disruption to the Air Force operations is held to a minimum.

It is projected that Area A will be developed with 525 condominiums and Area B will be developed with 600,000 - 800,000 square feet of warehousing, private offices, the Base Exchange, a health club and medical offices (City of Manhattan Beach, 2007).

Due to the proximity of this project to the Refinery and because of its size, it is likely that it would have potential to generate cumulative impacts. Therefore, environmental impacts from the LAAFB project were evaluated in detail in the cumulative impacts analysis for the proposed project.

**5.1.1.4 Other Projects in the Cities of El Segundo and Manhattan Beach (#5-14)**

There are other projects in the Cities of El Segundo and Manhattan Beach that are in the planning phase and which could add to cumulative impacts. A review of the websites of both Cities, and correspondence with the City of Manhattan Beach planning department, identified eight such projects. Although limited information is available on most of these projects, the available relevant information pertaining to these projects is presented in Table 5-1. The projects with available information to provide a project description are discussed below. For some projects, the only information available is that on the project size (i.e., those in Table 5-1) and CEQA documents are not available for these projects. Cumulative impacts for these projects will be evaluated to the extent feasible using default assumptions.

**5.1.1.5 Other Capital Projects at the Chevron Refinery (#15-22)**

Chevron has several capital projects scheduled for construction. Table 5-2 provides a list of unrelated projects at the Chevron Refinery whose construction may overlap with the proposed project. Of these projects, the only project for which a CEQA document has currently been prepared is the FCC SCR project. The other projects are either exempt from CEQA or are not far enough along in the planning process for a CEQA document to be prepared.

**TABLE 5-1**

**Other Related Projects in the Cities of El Segundo and Manhattan Beach<sup>(1)</sup>**

<b>Map No.</b>	<b>Address/Location</b>	<b>Size in units</b>	<b>Project Description</b>	<b>Distance from Proposed Project</b>
5	1950 Grand Ave., El Segundo	93,569 square feet	Office Building	< 1/4 mile
6	Electronics Superstore, Aviation Blvd./ Utah Ave., El Segundo	152,504 square feet	Commercial building to take the place of existing R&D, office and warehouse.	< 1 mile
7	2151 E. Grand Ave., El Segundo	125,000 square feet	Office Building	< ½ mile
8	455/475 Continental Blvd., El Segundo	4 buildings totaling 530,000 square feet	Three office buildings and one R&D Center	< ½ mile
9	2201 Highland Ave, Manhattan Beach	1,600 square feet	Retail/Restaurant & 2 DU condominium	< 1 mile
10	1300 Highland Ave., Manhattan Beach	15,000 square feet	Mixed use office/commercial	< 1 ½ miles
11	NE corner of Sepulveda Blvd. & Marine Ave., Manhattan Beach	52,174 square feet	Commercial (Manhattan Village Shopping Center)	< ½ mile
12	2200 Sepulveda Ave., Manhattan Beach	29,000 square feet	Office Building	< 1 mile
13	DWP Right-of-Way (Dunes)	N/A	Public Use Green Belt	< ½ mile
14	1100 Manhattan Beach Boulevard, Manhattan Beach	13,396 square feet	Retail Pharmacy	About one mile

(1) Source: City of Manhattan Beach, e-mail correspondence with Laurie B. Jester, October 2007.

TABLE 5-2

Other Chevron Capital Projects

Map No.	Project Name	Project Scope	Est. Construction Start Date	Est. Construction End Date
15	Houdry Compressor Replacement	Replace compressors K-2002/2003/2004 with new compressors.	7/10/2007	8/31/2007
16	ISOMAX New Compressors	Install 2 new compressors to augment the existing eductors	7/10/2007	11/30/2008
17	FCC SCR <sup>(1)</sup>	Install 2 parallel SCRs at the FCC for NOx control to meet limits required by the NSR consent decree	9/1/2007	6/30/2008
18	Refinery Optimization Center (ROC)	Construct a new centralized Refinery control center east of the Main Building	12/2007	12/2009
19	No. 2 Crude/Resid Cutpoint	Install new heat exchangers and new ejector; demolish and replace one vessel	9/2007	9/31/2008
20	LPG Rack Segregation	Install new liquid separators; Replace existing vessels with larger ones; Reroute pressure safety valves to ISOMAX Relief	3/2008	8/2008
21	T-943 New Jet Tank Construction	Construct a new 150 feet diameter by 64 feet high jet tank	3/2008	3/2009
22	Purchasing Building - Remodeling	Remodel a 3-story building to turn into office spaces.	3/2008	10/2008

(1) A negative declaration was prepared for this project. See SCAQMD 2007a. CEQA documents have not been prepared for the other proposed projects.

## 5.2 AIR QUALITY

### 5.2.1 CONSTRUCTION IMPACTS

Currently, the Basin is designated non-attainment for ozone, PM10, and PM2.5. Construction activities for some of the projects described in Section 5.1 have the potential to overlap with the proposed Chevron project and result in a short-term significant impact on air quality (see Table 5-3). The proposed Chevron project could result in significant construction emissions for CO, VOC, NOx, PM10, and PM2.5 during the construction period (see Table 4-3). Therefore, the air quality impacts associated with construction activities are considered significant.

The projects identified in Table 5-3 have the potential for construction activities that overlap with the construction activities for the proposed Chevron project. Table 5-3 summarizes the available construction emissions data for the related projects. On a cumulative basis, construction emissions would exceed the thresholds established by the SCAQMD for CO, VOC, NOx, and PM10 assuming they occur at the same time. Table

TABLE 5-3

**Cumulative Construction Air Quality Impacts  
(pounds per day)**

No.	Project	Type of Project	Estimated Emissions				
			CO	VOC	NOx	SOx	PM10
	Proposed Chevron Process Reliability & Optimization Project <sup>(1)</sup>	Refinery	708.99	152.45	754.27	1.04	177.01
1	Sepulveda/Rosecrans Site Rezoning & Plaza El Segundo Development <sup>(2)</sup>	Commercial/Mixed use	576	235	431	0	27
2	El Segundo Power Plant <sup>(3)</sup>	Industrial	1029.00	117.05	443.56	16.31	52.14
3	LA Air Force Base Area A <sup>(4)</sup>	Mixed use	82.52	81.12	58.55	0.08	60.09
4	LA Air Force Base Area B <sup>(4)</sup>	Mixed use	132.87	399.66	96.12	0.16	67.03
5	1950 Grand Ave., El Segundo <sup>(4)</sup>	Office Building	32.39	158.67	39.16	0.01	9.07
6	Electronics Superstore, Aviation Blvd./ Utah Ave., El Segundo <sup>(4)</sup>	Commercial	37.46	106.51	39.91	0.02	13.81
7	2151 E. Grand Ave., El Segundo <sup>(4)</sup>	Office Building	35.33	100.21	40.18	0.02	11.61
8	455/475 Continental Blvd., El Segundo <sup>(4)</sup>	Office Building and R&D Center	70.46	263.78	47.12	0.06	45.08
9	2201 Highland Ave, Manhattan Beach <sup>(4)</sup>	Commercial	14.77	7.04	28.07	0	1.84
10	1300 Highland Ave., Manhattan Beach <sup>(4)</sup>	Commercial/Offices	15.76	22.87	28.07	0	2.62
11	NE corner of Sepulveda Blvd. & Marine Ave., Manhattan Beach <sup>(4)</sup>	Commercial	19.25	41.53	28.07	0.01	5.67
12	2200 Sepulveda Ave., Manhattan Beach <sup>(4)</sup>	Medical Offices	17.06	42.93	28.07	0.01	3.76
14	1100 Manhattan Beach Boulevard, Manhattan Beach <sup>(4)</sup>	Retail	15.70	27.54	28.07	0	2.55
15	Houdry Compressor Replacement <sup>(5)</sup>	Refinery	90.09	24.33	108.42	0.12	15.05
16	ISOMAX New Compressors <sup>(5)</sup>	Refinery	90.09	24.33	108.42	0.12	15.05
17	FCC SCR <sup>(6)</sup>	Refinery	235.81	32.41	94.53	0.21	10.32

TABLE 5-3 (concluded)

No.	Project	Type of Project	Estimated Emissions				
			CO	VOC	NOx	SOx	PM10
19	No.2 Crude/Resid Cutpoint <sup>(5)</sup>	Refinery	95.25	19.99	95.36	0.12	8.51
20	LPG Rack Segregation <sup>(5)</sup>	Refinery	13.63	2.69	13.96	0.02	4.63
21	T-943 New Jet Tank Construction <sup>(5)</sup>	Refinery	13.63	2.69	13.96	0.02	4.63
<b>Total Emissions</b>			3,326	1,863	2,525	18	537
<b>SCAQMD Thresholds</b>			550	75	100	150	150
<b>Significant</b>			<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>

(1) See Table 4-3; (2) City of El Segundo, 2004a; (3) CEC, 2002; (4) Emission estimates were estimated using the URBEMIS 2007 model, which provides PM2.5 emission estimates. However, PM2.5 emission have not been calculated for all projects and therefore, PM2.5 emissions have not been tabulated; (5) Emissions estimated through project specific data; and (6) SCAQMD, 2007a.

5-3 does not provide emission estimates of PM2.5 because PM2.5 emissions have not been calculated and are not available for most projects.

Due to the variety in the list of cumulative projects and various emission calculation methodologies, it is difficult to estimate emissions of PM2.5. Nonetheless, it is assumed that the cumulative emissions of PM2.5 are significant for the following reasons. A large portion of PM10 consists of PM2.5 and the significance threshold for PM2.5 is much lower than PM10 (55 pounds per day versus 150 pounds per day). Further, the cumulative emissions of PM10 are an estimated 540 pounds per day, which is well over the significance threshold of 150 pounds per day. Therefore, it is expected that cumulative PM2.5 emissions will exceed the SCAQMD CEQA significance threshold of 55 pounds per day and are also significant. Mitigation measures to reduce air emissions associated with construction activities are necessary primarily to control emissions from heavy construction equipment and worker travel.

## 5.2.2 OPERATIONAL EMISSIONS IMPACTS

During operation, some of the projects are expected to reduce overall air pollutant emissions. However, there are regional increases for certain air pollutants (see Table 5-4). Direct stationary emission sources are generally subject to regulation. The emissions associated with the operational phase of the proposed Chevron project are shown in Chapter 4, Table 4-4. The operation of the Chevron project will not exceed the SCAQMD thresholds, after mitigation, so no significant air quality impacts are expected from the proposed project.

TABLE 5-4

## Cumulative Operational Air Quality Impacts (pounds per day)

No.	Project	Type of Project	Estimated Emissions				
			CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
	Proposed Chevron Process Reliability & Optimization Project <sup>(1)</sup>	Refinery	389.3	2.8	-188.9	206.4	13.7
2	El Segundo Power Plant <sup>(2)</sup>	Industrial	14,210.96	1,114.28	2,782.64	167.31	1,837.09
3	LA Air Force Base Area A <sup>(3)</sup>	Mixed use	416.68	66.70	53.08	0.35	11.05
4	LA Air Force Base Area B <sup>(3)</sup>	Mixed use	1339.04	134.93	163.04	1.11	179.26
5	1950 Grand Ave., El Segundo <sup>(3)</sup>	Office Building	109.00	10.60	13.25	0.09	14.58
6	Electronics Superstore, Aviation Blvd./ Utah Ave., El Segundo <sup>(3)</sup>	Commercial	450.3	47.04	55.35	0.37	59.06
7	2151 E. Grand Ave., El Segundo <sup>(3)</sup>	Office Building	145.08	14.11	17.69	0.12	19.47
8	455/475 Continental Blvd., El Segundo <sup>(3)</sup>	Office Building and R&D Center	609.94	59.41	75.95	0.51	82.58
9	2201 Highland Ave, Manhattan Beach	Commercial	15.23	1.71	1.50	0.01	1.51
10	1300 Highland Ave., Manhattan Beach <sup>(3)</sup>	Commercial/Offices	21.15	1.98	2.40	0.02	2.66
11	NE corner of Sepulveda Blvd. & Marine Ave., Manhattan Beach <sup>(3)</sup>	Commercial	148.04	15.48	18.10	0.12	19.27
12	2200 Sepulveda Ave., Manhattan Beach <sup>(3)</sup>	Medical Offices	34.88	3.37	4.12	0.03	4.52
14	1100 Manhattan Beach Boulevard, Manhattan Beach <sup>(3)</sup>	Retail	80.3	8.18	9.57	0.06	2.06
15	Houdry Compressor Replacement <sup>(4)</sup>	Refinery	0.00	0.00	0.00	0.00	0.00
16	ISOMAX New Compressors <sup>(4)</sup>	Refinery	0.00	13.6	0.00	0.00	0.00
17	FCC SCR <sup>(4)</sup>	Refinery	0.00	0.00	0.00	0.00	0.00
18	ROC <sup>(3)</sup>	Office Building	25.95	2.31	3.03	0.02	3.4

TABLE 5-4 (cont'd)

No.	Project	Type of Project	Estimated Emissions				
			CO	VOC	NOx	SOx	PM10
19	No.2 Crude/Resid Cutpoint <sup>(4)</sup>	Refinery	0.00	6.8	0.00	0.00	0.00
21	T-943 New Jet Tank Construction <sup>(4)</sup>	Refinery	0.00	5.9	0.00	0.00	0.00
<b>Total Emissions</b>			17,996	1,509	3,011	377	2,250
<b>SCAQMD Thresholds</b>			550	55	55	150	150
<b>Significant</b>			<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>

(1) See Tables 4-4 and 4-5; (2) CEC, 2002; (3) Emission estimates were estimated using the URBEMIS 2007 model; and (4) Emissions estimated through project specific data.

Air quality impacts associated with cumulative projects are shown in Table 5-4. Emission estimates are not available for all projects; for those projects default emission factors were used when possible, i.e., the type of land use and size of the development are available. For certain projects, operational emissions were expected to result in a decrease or no increase in emissions (e.g., Sepulveda/Rosecrans Site Rezoning and Plaza El Segundo Development) and those projects have been omitted from Table 5-4. Cumulative air quality impacts are expected to exceed the SCAQMD mass emission thresholds for CO, VOC, NOx, SOx, and PM10. As explained in Section 5.2.1, PM2.5 emissions are also expected to be significant. Therefore, the cumulative air quality impacts for CO, VOC, NOx, SOx, PM10, and PM2.5 are expected to be significant.

### 5.2.3 TOXIC AIR CONTAMINANTS

The impacts from TACs are localized impacts. As indicated in Table 5-1, most related projects are located at sufficient distances that potential toxic air contaminant impacts would not overlap with Chevron's PRO Project. The proposed project impacts on health effects associated with exposure to TACs is expected to be below the CEQA significance thresholds and, therefore, less than significant. The proposed project impacts on cancer risk to the MEIR and MEIW were estimated to be 0.33 per million and 0.22 per million, respectively, which is well below the significance threshold of 10 per million. The acute and chronic health indices were estimated to be 0.031 and 0.007 respectively, which is well below the significance threshold of one (1.0). Therefore, the proposed project impacts are not expected to contribute to cumulative impacts and are not considered to be cumulatively considerable. The other Refinery projects are small projects and will not generate substantial quantities of TACs. Cumulative impacts of TACs on health are expected to be less than significant.

The only other major industrial project in the area that is likely to emit TACs is the El Segundo Power Plant Redevelopment Project. A health risk assessment for this project was completed (CEC, 2002). The cancer risk to the maximum exposed individual was calculated to be 0.94 per million. The maximum acute and chronic health indices were

estimated to be 0.01 and 0.02, respectively. The potential overlap of the El Segundo Power Plant and the Chevron PRO Project would be well below the significance criteria of 10 per million for carcinogenic risk and 1.0 for the acute and chronic hazard indices. The other cumulative projects are commercial and residential project and are not expected to be major contributors to TAC emissions. Cumulative impacts of TACs on health are expected to be less than significant.

## **5.2.4 GREENHOUSE GASES**

### **5.2.4.1 Environmental Setting**

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of GHGs in the atmosphere. The six major GHGs identified by the Kyoto Protocol are CO<sub>2</sub>, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), haloalkanes (HFCs), and perfluorocarbons (PFCs). The GHGs absorb longwave radiant energy reflected by the earth, which warms the atmosphere. GHGs also radiate longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation absorbed by the atmosphere is known as the "greenhouse effect." Some studies indicate that the potential effects of global climate change may include rising surface temperatures, loss in snow pack, sea level rise, more extreme heat days per year, and more drought years.

Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. As reported by the CEC, California contributes 1.4 percent of the global and 6.2 percent of the national GHGs emissions (CEC, 2004). The GHG inventory for California is presented in Table 5-5 (CARB, 2007). Approximately 80 percent of GHGs in California are from fossil fuel combustion and over 70 percent of GHG emissions are carbon dioxide emissions (see Table 5-5).

In response to growing scientific and political concern regarding global climate change, California has recently adopted a series of laws to reduce both the level of GHGs in the atmosphere and to reduce emissions of GHGs from commercial and private activities within the state. In September 2002, Governor Gray Davis signed Assembly Bill (AB) 1493, requiring the development and adoption of regulations to achieve "the maximum feasible reduction of greenhouse gases" emitted by noncommercial passenger vehicles, light-duty trucks, and other vehicles used primarily for personal transportation in the State. Setting emission standards on automobiles is normally the responsibility of the U.S. EPA. The Federal Clean Air Act, however, allows California to set a state-specific emission standard on automobiles if it first obtains a waiver from the U.S. EPA. On December 19, 2007 the U.S. EPA denied California's request for a waiver. In response, California sued the U.S. EPA claiming that the denial was not based on the scientific data.

**TABLE 5-5**

**California GHG Emissions and Sinks Summary**  
(Million metric tons of CO<sub>2</sub> equivalence)

<b>Categories Included in the Inventory</b>	<b>1990</b>	<b>2004</b>
<b>ENERGY</b>	<b>386.41</b>	<b>420.91</b>
<b>Fuel Combustion Activities</b>	<b>381.16</b>	<b>416.29</b>
Energy Industries	157.33	166.43
Manufacturing Industries & Construction	24.24	19.45
Transport	150.02	181.95
Other Sectors	48.19	46.29
Non-Specified	1.38	2.16
<b>Fugitive Emissions from Fuels</b>	<b>5.25</b>	<b>4.62</b>
Oil and Natural Gas	2.94	2.54
Other Emissions from Energy Production	2.31	2.07
<b>INDUSTRIAL PROCESSES &amp; PRODUCT USE</b>	<b>18.34</b>	<b>30.78</b>
Mineral Industry	4.85	5.90
Chemical Industry	2.34	1.32
Non-Energy Products from Fuels & Solvent Use	2.29	1.37
Electronics Industry	0.59	0.88
Product Uses as Substitutes for Ozone Depleting Substances	0.04	13.97
Other Product Manufacture & Use Other	3.18	1.60
Other	5.05	5.74
<b>AGRICULTURE, FORESTRY, &amp; OTHER LAND USE</b>	<b>19.11</b>	<b>23.28</b>
Livestock	11.67	13.92
Land	0.19	0.19
Aggregate Sources & Non-CO <sub>2</sub> Emissions Sources on Land	7.26	9.17
<b>WASTE</b>	<b>9.42</b>	<b>9.44</b>
Solid Waste Disposal	6.26	5.62
Wastewater Treatment & Discharge	3.17	3.82
<b>EMISSION SUMMARY</b>		
<b>Gross California Emissions</b>	<b>433.29</b>	<b>484.4</b>
<b>Sinks and Sequestrations</b>	<b>-6.69</b>	<b>-4.66</b>
<b>Net California Emissions</b>	<b>426.60</b>	<b>479.74</b>

Source: CARB, 2007.

In June 2005, Governor Schwarzenegger signed Executive Order S-3-05, which established GHG emissions reduction targets for the state, as well as a process to ensure that the targets are met. As a result of this executive order, the California Climate Action Team (CAT), led by the Secretary of the California State Environmental Protection Agency (CalEPA), was formed. The CAT published its report in March 2006, in which it

laid out several recommendations and strategies for reducing GHG emissions and reaching the targets established in the executive order.<sup>1</sup> The greenhouse gas targets are:

- By 2010, reduce to 2000 emission levels;
- By 2020, reduce to 1990 emission levels; and,
- By 2050, reduce to 80 percent below 1990 levels.

In September 2006, Governor Schwarzenegger signed California's Global Warming Solutions Act of 2006 (AB32). AB32 will require CARB to:

- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions, by January 1, 2008;
- Adopt mandatory reporting rules for significant sources of GHG emissions by January 1, 2008;
- Adopt an emissions reduction plan by January 1, 2009, indicating how emissions reductions will be achieved via regulations, market mechanisms, and other actions; and,
- Adopt regulations to achieve the maximum technologically feasible and cost-effective reductions of GHGs by January 1, 2011.

SB1368, a companion bill to AB32, requires the California Public Utilities Commission (CPUC) and the CEC to establish GHG emission performance standards for the generation of electricity, whether generated inside the State or generated outside and then imported into California. SB1368 provides a mechanism for reducing the emissions of electricity providers, thereby assisting CARB to meet its mandate under AB32. On January 25, 2007, the CPUC adopted an interim GHG Emissions Performance Standard (EPS), which is a facility-based emissions standard requiring that all new long-term commitments for baseload generation to serve California consumers be with power plants that have GHG emissions no greater than a combined cycle gas turbine plant. That level is established at 1,100 pounds of CO<sub>2</sub> per megawatt-hour (MW-hr). Further, on May 23, 2007, the CEC adopted regulations that establish and implement an EPS of 1,100 pounds of CO<sub>2</sub> per MW-hr (see CEC order No. 07-523-7).

California Senate Bill 97 (SB97), passed in August 2007, is designed to work in conjunction with CEQA and AB32. SB97 requires the California Office of Planning and Research (OPR) to prepare and develop guidelines for the mitigation of GHG emissions or the effects thereof, including but not limited to, effects associated with transportation

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<sup>1</sup> California Climate Action Team. Climate Action Team Report to Governor Schwarzenegger and the Legislature, 2006.

and energy consumption. These guidelines must be transmitted to the Resources Agency by July 1, 2009, to be certified and adopted by January 1, 2010. The OPR and the Resources Agency shall periodically update these guidelines to incorporate new information or criteria established by CARB pursuant to AB32. SB97 will apply to any EIR, negative declaration, mitigated negative declaration, or other document required by CEQA, prepared for a limited number of types of projects, which has not been finalized. SB 97 will be automatically repealed January 1, 2010.

There has also been activity at the Federal level on the regulation of GHGs. In *Massachusetts v. Environmental Protection Agency* (Docket No. 05–1120), argued November 29, 2006 and decided April 2, 2007, the U.S. Supreme Court held that not only did the U.S. EPA have authority to regulate greenhouse gases, but that the U.S. EPA's reasons for not regulating greenhouse gases did not fit the statutory requirements. The U.S. Supreme Court ruled that CO<sub>2</sub> and other greenhouse gases are pollutants under the Clean Air Act, which U.S. EPA must regulate if it determines they pose an endangerment to public health or welfare. To date, the U.S. EPA has not made such a finding or developed a regulatory program for greenhouse gas emissions.

The SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the AQMP. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

- phase out the use and corresponding emissions of chlorofluorocarbons (CFCs), methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;
- phase out the large quantity use and corresponding emissions of hydrochlorofluorocarbons (HCFCs) by the year 2000;
- develop recycling regulations for HCFCs (e.g., SCAQMD Rules 1411 and 1415);
- develop an emissions inventory and control strategy for methyl bromide; and,
- support the adoption of a California greenhouse gas emission reduction goal.

The legislative and regulatory activity detailed above is expected to require significant development and implementation of energy efficient technologies and shifting of energy production to renewable sources.

Chevron has reported its verified GHG emissions (all six GHGs, as applicable) to the California Climate Action Registry (CCAR) for the years 2004-2006. Chevron's emissions (2004-2006) reported to CCAR for all Chevron's sources within California, were approximately 13.1 million metric tons per year. According to the California Air

Resources Board’s inventory of emissions, the total statewide net GHG emissions in 2004 were approximately 480 million metric tons per year of CO<sub>2</sub> equivalent emissions. Chevron’s global emissions have been estimated to be about 61.9 million metric tons in 2006. Global emissions of GHGs in 1990 were estimated by the Intergovernmental Panel on Climate Change to be 32,100 million metric tons of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) emissions.

The two-year average GHG emissions from the El Segundo Refinery for 2005-2006 were calculated to be 3.588 million metric tons (see Table 5-6). The major source of emissions is combustion of fuel in heaters and boilers. Other sources of GHG emissions include fuel combustion in the cogeneration units, combustion of coke in the FCCU, and the carbon dioxide vent in the Hydrogen Plant.

**TABLE 5-6**

**Chevron El Segundo Refinery  
Greenhouse Gas Emissions Summary**

<b>GHG Emissions</b>	<b>2005 (million metric tons)</b>	<b>2006 (million metric tons)</b>	<b>2-Year Average Emission Rate (million metric tons)</b>
All Refinery Sources	3.559	3.613	3.588

**5.2.4.2 Significance Criteria**

The analysis of GHGs is a much different analysis than the analysis of criteria pollutants for the following reasons. For criteria pollutants, significance thresholds are based on daily emissions because attainment or non-attainment is based on daily exceedances of applicable ambient air quality standards. Further, several ambient air quality standards are based on relatively short-term exposure effects on human health, e.g., one-hour and eight-hour. Since the half-life of CO<sub>2</sub> is approximately 100 years, for example, the effects of GHGs are longer-term, affecting global climate over a relatively long time frame. As a result, the SCAQMD's current position is to evaluate GHG effects over a longer timeframe than a single day.

While direct GHG emissions can be calculated, the emissions cannot be precisely correlated with specific impacts based on currently available science. Climate change is a global phenomenon, making it difficult to develop the scientific tools and policy needed to select a CEQA significance threshold for climate change or GHG emissions. Refinery projects will be subject to any regulations developed under AB32 as determined by CARB. As there are currently no emission significance thresholds to assess GHG emission effects on climate change, the SCAQMD does not currently have a “significance threshold” to determine whether a project will have a significant impact on

global warming or climate change. In the absence of regulatory guidance, and before the resolution of various legal challenges related to global climate change analysis and the selection of significance thresholds, a significance determination will be made on a case-by-case basis.

GHGs do not have human health effects like criteria pollutants. Rather, it is the increased accumulation of GHGs in the atmosphere that may result in global climate change. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project. Furthermore, the proposed project's GHG emissions will be small relative to total global or even statewide GHG emissions. Thus, the significance of potential impacts from GHG emissions related to the proposed project has been analyzed for long-term operations on a cumulative basis, as discussed further below.

#### **5.2.4.3 Environmental Impacts**

Reporting indirect GHG emissions is a requirement of the California Climate Action Registry reporting program and CARB staff has considered extensively the value of indirect emissions in a mandatory reporting program. CARB believes that indirect energy usage provides a more complete picture of the emissions footprint of a facility. "As facilities consider changes that would affect their emissions – addition of a cogeneration unit to boost overall efficiency even as it increases direct emissions, for example – the relative impact on total (direct plus indirect) emissions by the facility should be monitored. Annually reported indirect energy usage also aids the conservation awareness of the facility and provides information" to CARB to be considered for future strategies by the industrial sector. For these reasons, CARB has proposed requiring the calculation of direct and indirect GHG emissions as part of the AB32 reporting requirements (CARB, 2007a). Therefore, direct and indirect emissions have been calculated for the proposed PRO Project.

#### **Project GHG Emissions**

The new and modified equipment built as part of the Chevron PRO Project has been evaluated for all GHG emission sources, including both energy supplied via purchased conventional power generation and with energy supplied by the installation of more energy efficient cogeneration power (combined power and steam generation). The PRO Project as proposed is estimated to result in an increase of 0.194 million metric tons/year of GHG (see Table 5-7) with GHG emission increases generated from Cogen Train D, the tail gas treating unit, and the pilots on the new flare.

Chevron evaluated the electrical needs of the PRO Project and determined that the proposed project would require about 29.9 MW of electricity plus additional steam to operate the proposed new and modified units. The business-as-usual approach would be to purchase the additional electricity from the local provider (SCE). If the Refinery were to continue to rely on SCE for electricity, a new 330 mmBtu/hr boiler would be required to generate additional steam needed for the PRO Project and other Refinery activities.

The GHG emissions that would be generated under the business-as-usual approach are estimated to be about 0.281 million metric tons per year, as summarized in Table 5-8.

**TABLE 5-7**

**Chevron PRO Project with Purchased Power  
GHG Emissions Summary<sup>(1)</sup>**

<b>Equipment</b>	<b>Fuel Input (mmBtu/hr)<sup>(2)</sup></b>	<b>GHG Emissions (metric tons/yr)</b>
New Cogen Train D <sup>(3)</sup>	653.2	290,075
Elimination of Purchased Electricity <sup>(4)</sup>	-200	-91,007
Tail Gas Treating Unit Incinerator <sup>(5)</sup>		42,600
Purge, Gas Pilots on New Safety Flare	0.95	431
Curtailmnt of Auxiliary Boiler <sup>(4)</sup>	-105.9	-48,189
<b>PRO Project (metric tons/yr)</b>		<b>193,910</b>
<b>PRO Project (million metric tons/yr)</b>		<b>0.194</b>

1. See Appendix C for detailed emission calculations - includes all applicable GHG emissions, i.e., CO<sub>2</sub>, N<sub>2</sub>O, and methane.
2. mmBtu/hr – million British Thermal Units per hour
3. 49.9 MW to supply power for the PRO Project and replaced purchased power for existing operations.
4. Average of 2005-2006 purchases reported in verified GHG reports.
5. CO<sub>2</sub> emissions based on material balance.

**TABLE 5-8**

**Chevron PRO Project GHG Emissions Summary  
Business-as-Usual Approach without Cogen Train D<sup>(1)</sup>**

<b>Equipment</b>	<b>Fuel Input (mmBtu/hr)<sup>(2)</sup></b>	<b>GHG Emissions (metric tons/yr)</b>
Tail Gas Unit Incinerator <sup>(3)</sup>		42,600
Purge Gas Pilots on New Safety Flare	0.95	431
SCE Supplied Power – Purchased Electricity <sup>(4)</sup>	299.0	136,056
New Fired Boiler	330.2	150,252
Curtailmnt of Auxiliary Boiler <sup>(5)</sup>	-105.9	-48,189
<b>PRO Project (metric tons/yr)</b>		<b>281,150</b>
<b>PRO Project (million metric tons/yr)</b>		<b>0.281</b>

1. See Appendix C for detailed emission calculations - includes all applicable GHG emissions, i.e., CO<sub>2</sub>, N<sub>2</sub>O, and methane..
2. mmBtu/hr – million British Thermal Units per hour
3. CO<sub>2</sub> emissions based on material balance.
4. PRO Project energy demand of 29.9 MW.
5. Average of 2005-2006 purchases reported in verified GHG report

Instead of business-as-usual, Chevron is proposing to install a new 49.9 MW cogeneration unit to supply the additional electricity and steam, and to reduce the amount of electricity purchased from the local provider, i.e., following project completion, Chevron will reduce the amount of electricity currently purchased from SCE by about 20

MW. With the installation of the 49.9 MW Cogen Train D, Chevron expects to supply most of the electricity used at the Refinery under normal operating conditions. Further, the steam required by the proposed project and other refinery activities can be generated by the Cogen Train D so that no new boiler is required and the use of the existing auxiliary boiler can be reduced under normal operating conditions.

Although the operation of the new Cogen Train D will result in an increase in GHG emissions at the Refinery, the new Cogen Train D will eliminate the purchase of electricity from less energy efficient sources. The new Cogen Train D will displace the existing average of 20 MW of purchased power along with the additional power needs of the proposed project and will also supply steam so that operation of an existing auxiliary boiler will be limited when the Cogeneration Facilities are in operation. Therefore, it is estimated that the PRO Project with the Cogen Train D would generate about 0.089 million metric tons/yr (0.281 – 0.192) less GHG emissions than the PRO Project with a new boiler plus SCE supplied power, i.e, business-as-usual.

### **Considerations in Determining Significance of Greenhouse Gas Emissions**

As stated previously, the SCAQMD has not yet established significance criteria for GHG emissions. Few, if any, other public agencies in California have established significance criteria for GHG emissions. In its CEQA and Climate Change white paper, CAPCOA has identified a number of potential approaches for determining the significance of GHG emissions in CEQA documents. Some of the approaches recommended by CAPCOA are summarized in the following subsections. In addition, the following discussions show how Chevron’s proposed PRO Project would compare to these approaches.

**CAPCOA's Green List:** CAPCOA has suggested that lead agencies should develop a “Green List of Projects” that is consistent with the goals of AB32. Such as list would allow agencies to encourage projects that are providing overall GHG emission benefits and complying with the goals of AB32. The suggested projects for inclusion on the Green List are as follows:

- Wind farm for generation of wind-powered electricity.
- Extension of transit lines to currently developed, but under-served communities.
- Development of high-density infill projects with easily accessible mass transit.
- Small hydroelectric power plants (5 MW or less).
- Cogeneration plants with a capacity of 50 MW or less at existing facilities.
- Increase in bus service or conversion to bus rapid transit service along an existing bus line.
- Projects with LEED “Platinum” rating.
- Expansion of recycling facilities within existing urban areas.
- Recycled water projects that reduce energy consumption related to water supplies that service existing development.
- Development of bicycle, pedestrian or zero emission transportation infrastructure to serve existing regions (CAPCOA, 2008).

The new Cogen Train D is, in itself, one of the preeminent technologies for minimizing GHG emissions included on CAPCOA’s “Green List of Projects.” Cogeneration is far more efficient (in both energy and GHG emissions), than separate generation of electricity (either by a simple cycle gas turbine or utility boilers) and steam.

As noted by CAPCOA, cogeneration plants are consistent with the goals of AB32 because they are much more efficient in generating electricity at the site where it is used, thus, minimizing energy losses associated with the transmission and distribution of electricity. Installing Cogen Train D as part of the PRO Project is consistent with CAPCOA’s Green List of Projects and, thus, the goals of AB32.

**CPUC and CEC Efficiency Standards:** Using energy efficiency as a potential measure for determining the significance of a project’s GHG emissions would be consistent with state law and policy. Assembly Bill 2021 (2006) requires the CEC to develop statewide energy efficiency potential estimates and targets for California’s investor-owned and publicly owned utilities. AB2021 provides “that all load serving entities procure all cost-effective energy efficiency measures so that the state can meet the goal of reducing total forecasted electrical consumption by ten percent in ten years.”<sup>2</sup> AB2021 also explicitly states that “energy efficiency programs will ameliorate air quality problems throughout the state and will also reduce harmful greenhouse gas emissions,” and labels energy efficiency measures as “an essential component of the state’s plan to meet the Governor’s greenhouse gas reduction targets established in Executive Order S-3-05.”<sup>3</sup>

In a recent staff report on the implementation of AB2021, the CEC recognized that energy efficiency measures are an essential component of the state’s plan to meet AB32’s GHG reduction goal, not only because electricity production is a significant source of GHG emissions, but also because energy efficiency is an attractive opportunity for reducing GHG emissions that is both emissions-free and often the lowest cost energy resource option (CEC, 2007).<sup>4</sup>

The use of energy efficiency as a potential significance measure allows recognition of a project’s overall reductions in GHG emissions compared to a business-as-usual approach or that might not otherwise be apparent by focusing on the total energy use picture. For example, a facility could implement efficiency measures that increase direct GHG emissions at the source while correspondingly reducing total GHG emissions by boosting overall efficiency. Thus, using energy efficiency as a means of measuring significance not only furthers the goals of AB32, but it also incentivizes companies to adopt measures that increase energy efficiency and thus reduce GHG emissions.

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<sup>2</sup> AB 2021, Sec. 1(a) (2006).

<sup>3</sup> *Id.*, Secs. 1(c), (d).

<sup>4</sup> See California Energy Commission, Draft Staff Report, Statewide Energy Efficiency Potential Estimates and Targets for California Utilities (Aug. 2007).

The PRO Project would eliminate 20 MW of existing demand from the SCE system by installing cogeneration technology, which is much more efficient. Cogeneration is generally substantially more energy efficient than energy generation alone. In a cogeneration facility, the waste heat from the electricity generating process is captured and used to produce high- and low-pressure steam, which can then be used as a heat source for industrial purposes. By harnessing heat that would otherwise be wasted, cogeneration technology provides greater conversion efficiencies than traditional generation methods and offers unique opportunities to reduce GHG emissions by increasing a facility's overall efficiency. Furthermore, the heat by-product is available for use without the need for the further burning of a primary fuel. Cogeneration offers the best use of valuable fossil fuels, combining high efficiency and low emissions, with reduced transmission losses due to being situated close to the end user.

Moreover, the CPUC and CEC have established EPS for the generation of electricity. To evaluate compliance with the standard, the electrical and thermal output of Cogen Train D was calculated and compared to the emissions performance standard (see Table 5-9). As shown in Table 5-9, the efficiency of the Cogen Train D is estimated to be 591 pounds of CO<sub>2e</sub> per MW-hr which is well below the emissions performance standard of 1,100 pounds of CO<sub>2</sub> per MW-hr. Therefore, the proposed Cogen Train D will be more energy efficient than required by CPUC and CEC standards, generating lower CO<sub>2</sub> emissions per MW-hr than required by CPUC and CEC standards.

### **Comparison of Chevron El Segundo Refinery Greenhouse Gas Emissions 1990 to 2010**

The proposed project employing the more energy efficient power and steam generation of a cogeneration plant rather than installing a boiler (business-as-usual) is expected to result in lower GHG emissions when compared to conventional purchased power. Further, as shown in Table 5-10, the GHG emissions from the Chevron Refinery are expected to be less in 2010, when the PRO Project becomes operational, than they were in 1990 as explained in the following paragraphs.

For comparison purposes and consistency with the goals of AB32, the GHG emissions from the Chevron El Segundo Refinery have also been evaluated for the 1990 operating conditions using historical operating data. GHG emissions are primarily associated with fuel combustion so the 1990 operating data were used to calculate the combustion emissions from heaters, boilers, cogeneration facilities, and flares based on the specific fuel type (propane, butane, natural gas, and refinery fuel gas). In addition, hydrogen plants are also sources of GHG emissions, so GHG emissions from hydrogen plants were calculated based on the amount of hydrogen produced. Based on all these factors, 1990 GHG emissions for the Refinery are estimated to be about 3.9 million metric tons of GHGs per year.

**TABLE 5-9**

**Comparison of GHGs from Cogen Train D to Emissions Performance Standard <sup>(1)</sup>**

	Fuel Input (mmBtu/hr)	Emission Factor	CO <sub>2</sub> e Emissions (lbs/hr)	Energy Output (MW-hr)	Efficiency (lbs CO <sub>2</sub> e/ MW-hr)
CO <sub>2</sub>					
Gas Turbine	524.7	110 <sup>(2)</sup>	57,717	--	--
Duct Burners	128.5	120,000 <sup>(3)</sup>	14,686	--	--
Subtotal, CO <sub>2</sub>	--	--	72,403	--	--
Methane	653.2	(1)	110 <sup>(5)</sup>	--	--
N <sub>2</sub> O	653.2	(1)	489 <sup>(5)</sup>	--	--
<b>Total CO<sub>2</sub> Equivalence<sup>(4)</sup></b>	--	--	73,002	--	--
Electrical Output (MW-hr)	--	--	--	49.90 <sup>(6)</sup>	--
Thermal Output (MW-hr)	--	--	--	73.53 <sup>(7)</sup>	--
Efficiency	--	--	--	--	591 <sup>(8)</sup>

- (1) See Appendix B for detailed emission calculations and all emission factors. The emission factors vary for the gas turbine and duct burners.
- (2) CO<sub>2</sub> emission factor is in lbs/mmBtu.
- (3) CO<sub>2</sub> emissions factor is in lbs/mmscf.
- (4) The emissions performance standard does not distinguish between CO<sub>2</sub> and CO<sub>2</sub>e emissions. For a conservative comparison, the proposed project includes methane and N<sub>2</sub>O.
- (5) In CO<sub>2</sub> equivalent emissions.
- (6) Electricity output is MW-hr.
- (7) Thermal Output converted from 250,869,000 Btu to MW-hr.
- (8) Energy Efficiency = CO<sub>2</sub>e Emissions / (Electrical Output + Thermal Output).

**TABLE 5-10**

**Chevron El Segundo Refinery  
Comparison of 1990 versus 2010 Greenhouse Gas Emissions**

CO <sub>2</sub> Emissions	GHG (million metric tons/year)
Annual Average Emissions <sup>(1)</sup>	3.588
Heavy Crude Project (4 <sup>th</sup> quarter 2007 Completion)	0.025
PRO Project Emissions	0.192
Subtotal Refinery Emissions 2010 (following PRO Project)	3.805
Estimated Emissions in 1990	3.941
Reduction from 1990	0.136

(1) See Table 5-6.

## CHAPTER 5: SUMMARY OF CUMULATIVE IMPACTS

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In the years since 1990, the Refinery has implemented a number of projects to improve energy efficiency (thereby reducing GHG emissions) and, in one case, to directly reduce CO<sub>2</sub> emissions from the Steam Naphtha Reformer (SNR). These projects include:

- Reducing the Scope of Operations - The Acid Plant and Propylene Polymer Plants Nos. 1 and 2 were shut down.
- Recovering SNR By-Product CO<sub>2</sub> - About one-half of the CO<sub>2</sub> vented to the atmosphere is now piped to an on-site purification/liquefaction facility operated by BOC Gases for recovery and sale.
- Consolidating Reforming Operations - The Aromatics Rheniformer/Aromatics Recovery Plant and the second stage of No. 1 Catalytic Reformer were shut down and the No. 2 Catalytic Reformer was converted to a CCR Unit.
- Replacing Process Heaters with More Efficient Units - Heaters at the SNR, ISOMAX, No. 2 RSU, and No. 1 Naphtha Hydrotreater were replaced.
- Installing Cogen Train C - Electrical demand on the Edison grid was reduced by 45 to 50 MW and the demand for steam produced in Refinery fired boilers was reduced by up to 270,000 lb/hr.
- Shutting Down Fired Boilers - Installation of Cogen Train C plus motorization of an FCCU compressor (formerly driven by a condensing steam turbine) and reduction of steam consumption, such as shutdown of the two oxygenate plants, made it possible to shut down one boiler at the FCCU and two boilers at the SNR.
- Replacing Potable Water with Reclaimed Wastewater – Since the 1990's the facility has transitioned potable water use to reclaimed wastewater. Based on water supply energy requirement comparison data from WBMWD, reclaimed water requires less energy than water supplied from the State Water Project and the Colorado River. The reduction in energy to supply approximately seven million gpd of reclaimed water to the Refinery instead of potable water reduces GHG emissions by approximately 7,200 metric tpy. (Note: Recycled water projects are also on the CAPCOA Green List.)

In more general terms, carbon intensity is the relative amount of carbon emitted per unit of energy or fuels consumed. By increasing energy efficiency, a project can show an increase in net benefits per unit of energy. The new Cogen Train D is, in itself, one of the preeminent technologies for minimizing GHG emissions. Cogeneration is far more efficient (in both producing energy and reducing GHG emissions), than separate generation of electricity and steam. As such and as demonstrated above, net GHG emissions from the proposed project are expected to be less than the proposed project with the use of purchased power. Moreover, GHG emissions will be less than the 1990 Refinery baseline - outpacing AB32's goal of reducing to 1990 emission levels by 2020.

Through the use of a highly energy efficient cogeneration system, the PRO Project exhibits a highly favorable level of carbon intensity compared to traditional technologies.

The rules, requirements, and regulations that will be placed on individual industries and facilities under AB32 are currently unknown because the regulations are currently being developed. It is possible that certain sectors of industry, including refineries, will be required to implement additional GHG emission reductions once the regulations required under AB32 are developed; however, such reduction requirements are currently unknown.

Based on the above analysis, the proposed project is consistent with the goals of AB32 for the following reasons:

- The proposed project is expected to result in an increase in GHG emissions; but eliminate the need for purchased power from less energy efficient power production facilities;
- The efficiency of the new Cogen Train D is estimated to be 591 pounds of CO<sub>2</sub>e per MW-hr, which is well below the CPUC and CEC EPS of 1,100 pounds of CO<sub>2</sub> per MW-hr;
- Refinery-wide GHG emissions have declined since 1990, which is consistent with the goals of AB32 since the GHG emissions following project completion in 2010 are expected to be less than the 1990 emission levels for the Chevron El Segundo Refinery, ten years in advance of AB32 goals;
- The major contributor of GHG in the PRO Project, the demand for additional power, has been mitigated by installing a cogeneration unit, which is, in itself, one of the preeminent technologies for minimizing GHG emissions. Cogeneration is far more efficient (in both energy and GHG emissions), than separate generation of electricity and steam and will eliminate the need for additional steam generation and SCE supplied power.

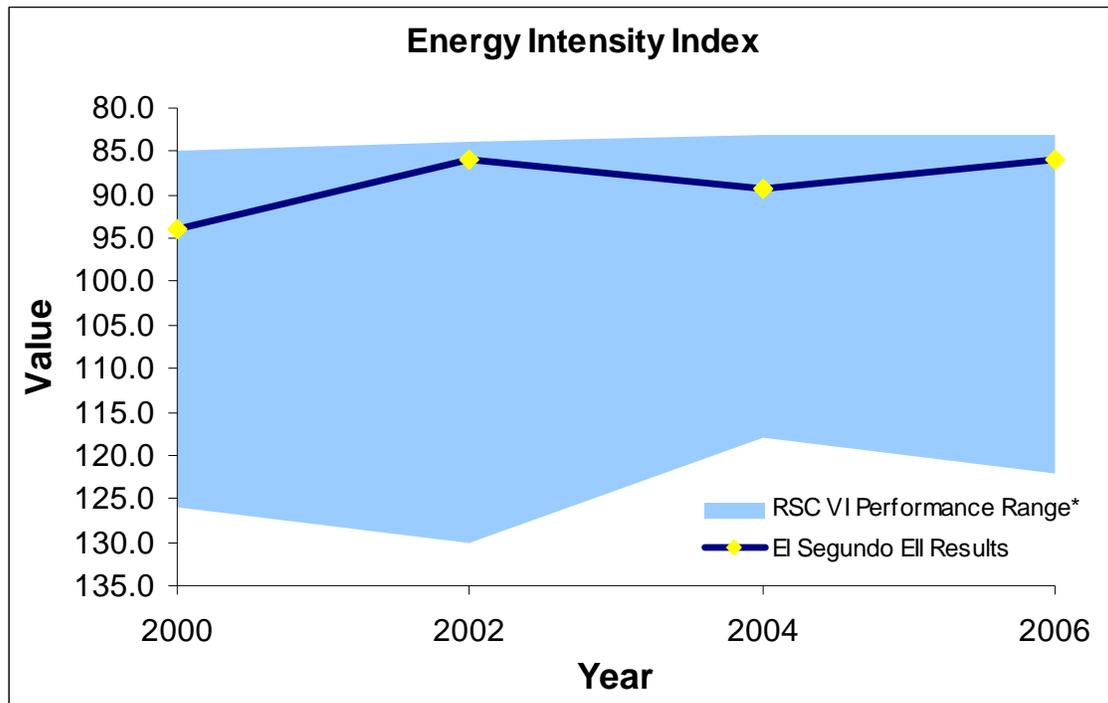
**Energy Efficiency Study:** In addition, the Chevron El Segundo Refinery has been recognized as being an energy efficient Refinery. Solomon Associates provides benchmarking<sup>5</sup> and consulting services to the petroleum, energy, and petrochemical industrial sectors. One of the ways to evaluate a specific refinery's energy efficiency is to look at their performance using the Solomon Associates reports which provide data on 20 refineries located in Refinery Supply Corridor VI (RSC VI) which includes California, Arizona, Nevada, Oregon, Washington, Alaska, and Hawaii.

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<sup>5</sup> Benchmarking is a practice or process in which organizations evaluation various aspects of their process in relation to best practices, usually within their own sector. This evaluation then allows for organizations to develop plans to adopt such best practice, usually with the aim of increasing some aspect of performance.

The Solomon reports evaluate energy efficiency data from each refinery in a given region and calculate their performance using what is called an Energy Intensity Index (EII). As calculated by Solomon, a lower EII means that the facility is more energy efficient. As shown in Figure 5-2, the Refinery has consistently ranked in the first quartile of energy efficient facilities in the Western United States.

**FIGURE 5-2**  
**ENERGY INTENSITY INDEX RESULTS**



Note : Solomon report data prior to 2000 had a different index basis and therefore, is not comparable to the current methodology.

As an example, over the past six years the Chevron El Segundo Refinery has invested in projects or made operational improvements that have reduced the Refinery EII by 8.4 percent, which translates into less energy consumed in producing a barrel of finished products. This improvement was substantially better on a percentage basis during the same period than the other top performers in RSC VI and is consistent with other investments that Chevron has made since the 1990's to improve the Refinery's overall energy efficiency and reduce GHG emissions from the Refinery.

**Conclusion:** In spite of all the past projects undertaken by Chevron and a proactive approach to reducing GHG emissions from the proposed project through the installation of a cogeneration unit, rather than taking a business-as-usual approach (i.e., installing a new boiler and increasing demand for electricity from SCE), the cumulative increase in

GHG emissions from the proposed project of 0.194 million metric tons per year is concluded to be significant. Given the position of the legislature on AB32, which states that global warming poses serious threats to the environment, and the requirements of CEQA for the lead agency to determine whether a project will have a significant impact, the overall effect of 0.194 million metric tons per year of GHG emissions is considered cumulatively considerable. Thus, the cumulative greenhouse gas impacts from the proposed project are considered significant. This determination is based on the lack of clear scientific or other criteria for determining the level of significance of the project's contribution to global warming and adverse changes in climate conditions.

#### **5.2.4.4 GHG Mitigation Measures**

Pursuant to CEQA Guidelines §15126.4(a)(1) if significant adverse environmental impacts are identified for a project, “An EIR shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy.” Potential mitigation measures for the PRO Project are discussed in the following paragraphs.

As part of the PRO Project, Chevron is proposing to install a new 49.9 MW cogeneration unit rather than take the business-as-usual approach of increasing demand for electricity from SCE and installing a new boiler. The new Cogen Train D will supply the electricity and steam required for the PRO Project, and will reduce the amount of electricity purchased from the local provider. As stated in Section 5.3.4.3, the Cogen Train D is one of the preeminent technologies for minimizing GHG emissions and is far more efficient in both energy production and reducing GHG emissions than separate generation of both electricity and steam. Following project completion, Chevron will reduce the amount of electricity currently purchased from SCE by about 20 MW and expects to supply most of the electricity used at the Refinery under normal operating conditions including the PRO Project. Although the operation of the new Cogen Train D will result in an increase in GHG emissions at the Refinery, the new Cogen Train D will eliminate the purchase of electricity from less energy efficient sources. It is estimated that the PRO Project with the Cogen Train D would generate about 0.089 million metric tons/yr less GHG emissions than without cogeneration, i.e., business-as-usual. As such, the Cogen Train D serves to mitigate excess CO<sub>2</sub> emissions from a business-as-usual approach which would involve the installation of a new boiler to provide steam and an increase in purchased power from SCE for the PRO Project.

In 2005, an Energy Efficiency Study of the Refinery was conducted by an independent third party to identify potential energy inefficient processes within the Refinery. The combustion of fuels and the generation of electricity is a major contributor to the generation of GHGs; thus, increasing energy efficiency of a facility would result in a decrease in GHGs. Therefore, the Energy Efficiency Study has served as a GHG audit, since energy efficiency improvements are associated with GHG emission reductions. As a result of the Study, 30 separate energy projects were identified that could potentially improve energy efficiency at the Refinery. Chevron has evaluated these potential projects to determine the feasibility of implementing them. Based on this review, to date,

Chevron has completed three of the projects that could be expedited, for a reduction of about 4,067 metric tons per year, with two more projects in progress for an additional reduction of 17,215 metric tons per year. There are an additional 12 projects which are undergoing further feasibility studies. Depending on the final outcome of the evaluation, four of the twelve projects could result in additional reductions of 31,045 metric tons per year of GHG emissions. Ten of the 30 the identified projects were eliminated from further consideration due to operational reliability concerns.

The three remaining energy projects are considered major capital projects due to the capital expense and long-term engineering requirements. The most important energy efficiency project of the three is the construction of an additional cogeneration plant at the Refinery, which has been incorporated into the PRO Project (Cogen Train D) along with a portion of a second project for modification of the FCCU gas recovery section. The remaining major capital project is still under evaluation. In addition to the benefits of the additional cogeneration plant, the two remaining major capital projects could potentially result in a reduction of about 34,000 tons per year of GHG, depending on the outcome of the engineering evaluation.

Specific mitigation measures for the proposed project are outlined below.

- GHG 1 To further offset GHG emissions from the PRO Project with the new Cogen Train D at the Refinery, Chevron shall offset the GHG emissions resulting from the proposed PRO Project, as shown in Table 5-7, through the purchase of CO<sub>2</sub> emission reduction credits. Chevron will make a contribution to the SCAQMD of \$1,500,000 to produce verifiable and quantifiable permanent GHG emission reductions, for example, which could include energy efficiency projects such as cogeneration facilities, solar collectors, wind turbines, biogas generators, geothermal energy generation, hydroelectric energy generation, biosolids energy production, transportation efficiency or other GHG emission reduction projects and, thus, offset the net increase in the PRO Project GHG emissions (see Table 5-7). Considering that the current market value for GHG emission credits is about \$5.00 per metric ton of GHG emissions, this amount is expected to more than cover the funding necessary to reduce Chevron's GHG emissions from the proposed PRO Project to zero.

The SCAQMD shall evaluate the GHG emission reduction projects and the credit market and, by June 30, 2010 (i.e., when the PRO Project is anticipated to become fully operational), will make a determination as to whether sufficient funds have been paid by Chevron to fully offset the GHG emissions for the PRO Project (see Table 5-7). Chevron may be required to fund any shortfall in the cost for emission credits to fully offset the GHG emissions generated by the proposed project over the \$1,500,000 initial payment, up to a maximum of 20 percent over the original payment or \$1.8 million, which represents approximately a 100 percent premium over current market value. In addition, GHG mitigation projects

completed by Chevron by December 31, 2010, not otherwise required by local, state, or federal regulations, can be used to offset GHG emission reduction shortfalls, if necessary, and the financial contribution to fund such offsets would be adjusted accordingly.

These mitigation fees, which are enforced as a mitigation measure in the air quality permit conditions, shall be paid to the SCAQMD no later than December 31, 2008. These fees shall be used to fund projects preferentially in the district, as certified by the SCAQMD, to produce verifiable and quantifiable GHG reductions.

Through implementation of these mitigation measures, the cumulative impacts of GHG emissions associated with the proposed PRO Project would be less than significant.

### **5.2.5 MITIGATION MEASURES**

For the construction period, the mitigation measures developed as part of the proposed Chevron project (see Section 4.2.3) will be imposed on other related projects, if the SCAQMD is the lead agency and project-specific impacts are concluded to be significant. The mitigation measures to minimize emissions associated with operation of stationary sources of the related projects include the use of BACT for all new emission sources and modifications to existing sources. BACT would be required for stationary sources regardless of whether the SCAQMD is the lead agency or is a responsible agency. The use of BACT would control localized emissions. A BACT review will be completed during the SCAQMD permit approval process for all new/modified sources.

### **5.2.6 LEVEL OF SIGNIFICANCE AFTER MITIGATION**

The cumulative adverse air quality impacts due to construction activities are expected to exceed the SCAQMD significance thresholds for all criteria pollutants except SO<sub>x</sub> and are considered to be cumulatively considerable, even after mitigation. The cumulative air quality impacts due to operational activities are expected to exceed the SCAQMD significance thresholds for all pollutants and are considered to be cumulatively considerable. The project-specific TAC health impacts would not be significant, and are not considered to be cumulatively considerable. GHG emission impacts are expected to be less than significant after mitigation, through the use of GHG emission offsets.

## **5.3 ENERGY**

CEQA Guideline §15130(a) indicates that an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider the effect significant, but must briefly describe the basis for concluding that the incremental effect is not cumulatively considerable. Therefore the project's contribution to energy impacts is not cumulatively

considerable and thus not significant because the proposed project will have beneficial energy impacts (CEQA Guidelines §15130). This conclusion is consistent with CEQA Guidelines §15064 (h)(4), which states, “The mere existence of cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project’s incremental effects are cumulatively considerable”. Nonetheless, information is provided regarding cumulative projects in the interest of the fullest disclosure.

### **5.3.1 CONSTRUCTION/OPERATIONAL IMPACTS**

The Chevron PRO Project and other projects will consume additional electricity. The new office and commercial buildings are expected to consume additional electricity. A portion of the LAAFB Project and the new Chevron office buildings will consolidate, upgrade, and replace existing office buildings so that the increase in electricity would be minimal. In addition, other projects at the Chevron Refinery are expected to require additional electricity. The PRO Project and the El Segundo Power Plant project will produce additional electricity, 49.9 MW and 280 MW, respectively. Following project completion, Chevron will generate sufficient electricity to operate most of the Refinery under normal operating conditions. Typically, power plants work to meet the demand. Therefore, the cumulative projects are not expected to result in significant increases in electrical demand and, in the case of Chevron, will create a new source of electrical power that will make the Refinery largely self sufficient under normal operations. No significant cumulative energy impacts are expected.

### **5.3.2 MITIGATION MEASURES**

New development will be required to comply with California Uniform Building Code requirements which establish energy conservation standards for new construction. These standards related to insulation requirements, glazing lighting, shading, window requirements, and water and space heating systems. Implementation of the energy conservation requirements is expected to minimize cumulative energy impacts.

### **5.3.3 LEVEL OF SIGNIFICANCE AFTER MITIGATION**

The impacts of the various projects on energy are not expected to be cumulatively considerable as some of the projects will generate additional electricity.

## **5.4 HAZARDS/HAZARDOUS MATERIALS**

CEQA Guideline §15130(a) indicates that an EIR shall discuss cumulative impacts of a project when the project’s incremental effect is cumulatively considerable. Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider the effect significant, but must briefly describe the basis for concluding that the incremental effect is not cumulatively considerable. Therefore the project’s contribution to hazards and hazardous materials impacts is not cumulatively considerable and thus not significant because the

environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130). This conclusion is consistent with CEQA Guidelines §15064(h)(4), which states, “The mere existence of cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project’s incremental effects are cumulatively considerable”. Nonetheless, information is provided regarding cumulative projects in the interest of the fullest disclosure.

#### **5.4.1 CONSTRUCTION/OPERATIONAL IMPACTS**

Although other industrial facilities exist in the general vicinity of the Refinery, the cumulative impacts from the onsite operation of the other industrial projects are not expected to be significant because it is extremely unlikely that upset conditions would occur at more than one facility at the same time. Further, hazard impacts at industrial facilities are not expected to overlap because of the distance between facilities. It also is extremely unlikely that an upset condition at one facility would create an upset at another nearby industrial facility because of the distance between facilities. The El Segundo Power Plant is located west of the Refinery. Most of the other related projects are associated with office buildings or other commercial uses, which generally do not handle or store large quantities of hazardous materials that could create hazardous situations.

The El Segundo Power Plant project included the use of additional aqueous ammonia and the construction of a pipeline from the Chevron Refinery to the plant. Activities related to hazardous materials associated with the El Segundo Power Plant are considered to be less than significant because the project was regulated by existing laws to prevent unacceptable off-site risks to the public. The Chevron PRO Project or other projects at the Refinery are not expected to result in cumulative impacts because the projects are expected to result in a decrease in the amount of ammonia produced and distributed from the Refinery. The FCCU SCR project will result in an increase in the use of aqueous ammonia associated with the installation of a new SCR unit at the Refinery. However, ammonia is produced at the existing ammonia plant at the Chevron Refinery so no increase in the amount of ammonia produced, stored on-site, or distributed is expected. Instead, there would be a reduction in the amount of ammonia sold to other end users. The new project-related explosion or fire hazard impacts associated with the proposed PRO Project are expected to stay within the confines of the existing Refinery or travel no further than existing hazards. Therefore, explosion or fire hazards are not expected to reach or overlap with hazard impacts from other industrial projects, so hazard impacts are not expected to be cumulatively considerable.

#### **5.4.2 MITIGATION MEASURES**

The proposed project impacts on hazards are considered to be less than significant. A number of existing rules and regulations apply to the Refinery and other industrial facilities that handle, transport or store hazardous materials. Compliance with these rules and regulations is expected to minimize industry-related hazards at the Refinery and other

industrial facilities. Site-specific mitigation measures for hazards may be required for other projects.

### **5.4.3 LEVEL OF SIGNIFICANCE AFTER MITIGATION**

The impacts of the various projects on hazards are not expected to be cumulatively considerable as hazards at or within one project area are not expected to impact or create hazards at other facilities.

## **5.5 HYDROLOGY/WATER QUALITY**

CEQA Guideline §15130(a) indicates that an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider the effect significant, but must briefly describe the basis for concluding that the incremental effect is not cumulatively considerable. Therefore the project's contribution to hydrology/water quality impacts is not cumulatively considerable and thus not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130). This conclusion is consistent with CEQA Guidelines §15064(h)(4), which states, "The mere existence of cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable". Nonetheless, information is provided regarding cumulative projects in the interest of the fullest disclosure.

### **5.5.1 CONSTRUCTION/OPERATIONAL IMPACTS**

#### **5.5.1.1 Water Supply**

The Chevron PRO Project includes modifications to allow the increase in production and use of reclaimed water that will be used for cooling tower purposes and boiler feed water. All of the increased water use associated with the proposed project (about 748,800 gpd) will be reclaimed water and can be provided by the local supplier. Therefore, the proposed project will not result in an increase in the use of potable water or an increase in water demand that exceeds the SCAQMD's project-specific water demand significance threshold, so no significant adverse impacts on water demand or supply are expected. In addition, the proposed project is not expected to result in water demand impacts that are cumulatively considerable.

The El Segundo Power Plant is expected to require about 207,000 gpd of additional water. Water demand impacts from the power plant are expected to be mitigated by the use of reclaimed water for some purposes (CEC, 2002). The other related projects are limited to office buildings, commercial buildings, and some residential buildings, which are not expected to be major users of water. The cumulative increase in water use of about 955,800 million gpd from all cumulative projects is expected to be less than the

SCAQMD's significance threshold of five million gpd. Therefore, the proposed project and the cumulative projects are not expected to produce significant adverse cumulative impacts to water demand.

#### **5.5.1.2 Wastewater**

The proposed project is anticipated to increase wastewater discharge from the Chevron Refinery by about 223,200 gpd (about 155 gpm) associated with the PRO Project. This represents about a three percent increase in wastewater discharge during maximum operating conditions. Wastewater generated by Chevron is treated on-site prior to discharge. No wastewater is sent off-site for treatment so no impacts to a publicly owned wastewater treatment plant will occur. No significant impacts associated with wastewater discharge are expected from the Chevron PRO Project.

Table 5-11 provides estimates of the wastewater generated by the cumulative projects in the area. Wastewater generated at the El Segundo Power Plant is also treated in on-site treatment facilities prior to discharge, so no impacts to public owned wastewater treatment facilities are expected. The other related projects are limited to office buildings, commercial buildings, and some residential buildings, which are not expected to be major generators of wastewater.

The total sewage generated by the related projects is shown in Table 5-11 and most of these facilities are expected to discharge to the LACSD sewage system which is treated by the Joint Water Pollution Control Plant (JWPCP). The JWPCP has a design capacity of about 385 million gpd and currently processes an average flow of 323 million gpd. Therefore, JWPCP has sufficient sewage treatment capacity to accommodate the sewage from the cumulative projects. Therefore, impacts to sewage service would not be cumulatively considerable.

#### **5.5.2 MITIGATION MEASURES**

The proposed project impacts on hydrology/water quality were less than significant. Since no cumulative impacts were identified, no mitigation measures are required.

#### **5.5.3 LEVEL OF SIGNIFICANCE AFTER MITIGATION**

The cumulative impacts on hydrology/water quality are considered to be less than significant without mitigation.

TABLE 5-11

Estimated Wastewater Generated by Cumulative Projects

No.	Address/Location	Size (Square Feet)	Project Description	Sewage Generation Factors (gals/1000 ft <sup>2</sup> ) <sup>(1)</sup>	Estimated Wastewater Generation (gals/day)
	Proposed Chevron Process Reliability & Optimization Project	--	Refinery	--	223,200 <sup>(2)</sup>
1	Sepulveda/Rosecrans Site Rezoning & Plaza El Segundo Development <sup>(3)</sup>	--	Commercial/Mixed Use	--	277,375
2	El Segundo Power Plant <sup>(4)</sup>	--	Industrial	--	150,000
3	LA Air Force Base Areas A	525 <sup>(5)</sup>	Condominium	160	148,079
4	LA Air Force Base Areas B	800,000 ft <sup>2</sup>	Mixed Use	80	64,000
5	1950 Grand Ave., El Segundo	93,569 ft <sup>2</sup>	Office Building	150	14,035
6	Electronics Superstore, Aviation Blvd./Utah Ave., El Segundo	152,504 ft <sup>2</sup>	Commercial	80	12,200
7	2151 E. Grand Ave., El Segundo	125,000 ft <sup>2</sup>	Office Building	150	18,750
8	455/475 Continental Blvd., El Segundo	530,000 ft <sup>2</sup>	Three Office Buildings and One R&D Center	150	79,500
9	2201 Highland Ave., Manhattan Beach	1,600 ft <sup>2</sup>	Retail/Restaurant	80	128
		1,600 ft <sup>2</sup>	2 DU Condominium	160	320
10	1300 Highland Ave., Manhattan Beach	15,000 ft <sup>2</sup>	Commercial/Office	150	2,250
11	NE corner of Sepulveda Blvd. & Marine Ave., Manhattan Beach	52,174 ft <sup>2</sup>	Commercial	80	4,174
12	2200 Sepulveda Ave., Manhattan Beach	29,000 ft <sup>2</sup>	Medical Offices	150	4,350
14	1100 Manhattan Beach Blvd., Manhattan Beach	13,396	Retail	80	1,072
<b>Cumulative Wastewater Increase:</b>					<b>999,433</b>

(1) Source: City of Los Angeles, 1998 unless otherwise noted.

(2) See Chapter 4, Subchapter 4.5.

(3) Source: Sepulveda/Rosecrans Site Rezoning and Plaza El Segundo Development, Draft EIR, October, 2004.

(4) Source: CEC, 2002.

(5) 525 individual condominiums.

## **5.6 NOISE**

CEQA Guideline §15130(a) indicates that an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider the effect significant, but must briefly describe the basis for concluding that the incremental effect is not cumulatively considerable. Therefore the project's contribution to noise impacts is not cumulatively considerable and thus not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130). This conclusion is consistent with CEQA Guidelines §15064(h)(4), which states, "The mere existence of cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable". Nonetheless, information is provided regarding cumulative projects in the interest of the fullest disclosure.

### **5.6.1 CONSTRUCTION IMPACTS**

Construction phases of each of the related projects are expected to generate localized, short-term noise impacts, some of which may be significant during construction. Construction activities associated with the industrial projects are located in industrial areas where limited sensitive receptors are located. The use of muffling devices, restriction of most construction work hours to daytime hours, compliance with local noise ordinances, etc., are expected to mitigate the increase in noise at most of the construction sites.

The cumulative construction impacts associated with the related industrial projects are not expected to be significant or exceed noise ordinances. The Refinery and other industrial projects are generally a sufficient distance (about 0.5 mile) apart that the noise levels are not expected to overlap. Some of the commercial/office buildings are located close to residential and other sensitive receptors and may create noise impacts in residential areas, but because of the distances from the Chevron project to the commercial/office projects, and to the residential areas, construction noise from Chevron's PRO project is not expected to contribute to the noise impacts at the residential or sensitive receptors. Construction activities are expected to be limited to daytime hours, which reduces the potential for impacts on sensitive receptors.

### **5.6.2 OPERATIONAL IMPACTS**

The operational noise impacts of the industrial projects are not expected to be significant. The noise impacts at the Chevron Refinery are not expected to result in a noticeable change to the surrounding community (see Subsection 4.6.2.2). The El Segundo Power Plant project is the only other industrial project in the general area of the Chevron Refinery. The mitigated operational noise at the southern boundary of the El Segundo Power Plant project was estimated to be no greater than 52 dBA (CEC, 2002). Therefore

the noise due to the new generators is not expected to have a significant noise effect and the noise would not overlap with noise sources at the Chevron Refinery. In addition, existing traffic noise levels are significant in the Vista Del Mar Boulevard corridor which runs between the power plant and the Refinery, generating a large portion of the community noise levels.

Most of the noise associated with other cumulative projects (e.g., commercial and office buildings) is expected to be primarily associated with traffic. Sufficient distance separates the Refinery from most of the other project, thus, it is unlikely that noise impacts will overlap. The proposed administration buildings are not expected to be a noise source, once construction is complete, because the buildings are expected to house about the same number of personnel. Existing noise levels from traffic in the vicinity are already considered unacceptable for certain residential areas because of high traffic volumes (e.g., traffic along the I-105 and I-405).

The noise impacts from the proposed project are not expected to be cumulatively considerable because other projects are located sufficient distance (about 0.5 mile) or more from the Chevron Refinery project areas so that noise impacts do not overlap with other related projects.

### **5.6.3 MITIGATION MEASURES**

Since noise impacts from the Refinery proposed project are not considered to be cumulatively considerable, they do not contribute to significant adverse cumulative worse impacts. As a result, no mitigation measures are required.

### **5.6.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION**

The noise impacts associated with the cumulative projects are not expected to be significant or contribute to significant adverse cumulative noise impacts during construction or operation.

## **5.7 SOLID/HAZARDOUS WASTE**

CEQA Guideline §15130(a) indicates that an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider the effect significant, but must briefly describe the basis for concluding that the incremental effect is not cumulatively considerable. Therefore the project's contribution to solid and hazardous waste impacts is not cumulatively considerable and thus not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130). This conclusion is consistent with CEQA Guidelines §15064(h)(4), which states, "The mere existence of cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed

project’s incremental effects are cumulatively considerable”. Nonetheless, information is provided regarding cumulative projects in the interest of the fullest disclosure.

## **5.7.1 CONSTRUCTION/OPERATIONAL IMPACTS**

### **5.7.1.1 Hazardous Waste**

The Chevron Refinery and El Segundo Power Plant projects are the main industrial developments in the area that have the potential to generate hazardous waste either through remediation activities or through the discovery of contaminated soils. The total amount of hazardous waste generated as contaminated soil is uncertain but maximum estimates are about 6,975 tons for Chevron and 4,000 cubic feet (about 4,000 tons) (assuming that 10 percent of the excavated soil is hazardous). Additional hazardous waste could include asbestos containing material, lead paint, and contaminated ground water (CEC, 2002). The impacts would be considered adverse, but not significant since the existing hazardous waste facilities have sufficient capacity to handle the one-time deposition of hazardous wastes that could be generated, e.g., contaminated soils. However, the additional waste streams may impact the dwindling capacity of certain landfills. An additional 200,000 gallons of waste oil and grease, paint, spent solvent, welding materials and cleaning solvents could be generated during the construction phase of the El Segundo Power Plant project, but most of these materials are expected to be recycled, e.g., waste oil and spent solvents are expected to be recycled (CEC, 2002). In addition to potentially contaminated soil, construction of the proposed Chevron PRO Project is anticipated to generate approximately 1,200 tons of hazardous waste (approximately 1,200 cubic yards) most of which is expected to be recycled. Together, the hazardous materials landfills in California have 10.8 million cubic yards permitted capacity, which will accommodate the waste generated by the proposed project during the construction phase. In addition, other hazardous waste facilities are located out-of-state that could potentially receive hazardous wastes from the projects. Therefore, the cumulative impact from the generation hazardous waste is not considered significant.

Most of the hazardous waste generated during the operational phase of the industrial projects includes used oil and spent catalysts, which are normally recycled to recover materials that have economic value. The office, commercial, and residential projects are not expected to generate substantial quantities of hazardous waste because they do not process hazardous materials as part of their operations. Therefore, no significant cumulative impacts on hazardous waste facilities are expected due to operation of the cumulative projects.

### **5.7.1.2 Solid Waste**

Non-hazardous solid wastes are usually generated in offices, commercial buildings, and residential units. The estimates of solid waste generated by cumulative projects are shown in Table 5-12, where sufficient data are available. Implementation of the related projects as well as cumulative growth in the County of Los Angeles would further increase demand on landfill capacity. Additional capacity to accommodate the

TABLE 5-12

Estimated Solid Waste Generated by Cumulative Projects

No.	Address/Location	Size (Square Feet)	Project Description	Solid Waste Generation Factors (tons/ ft <sup>2</sup> ) <sup>(1)</sup>	Estimated Solid Waste Generation (tons/year)
1	Sepulveda/Rosecrans Site Rezoning & Plaza El Segundo Development	850,000	Commercial/Mixed Use	N/A	6,375
3	LA Air Force Base Areas A	525 <sup>(2)</sup>	Condominium	0.918 <sup>(3)</sup>	482
4	LA Air Force Base Areas B	800,000 ft <sup>2</sup>	Mixed Use	0.0029	2,341
5	1950 Grand Ave., El Segundo	93,569 ft <sup>2</sup>	Office Building	0.0001	9.4
6	Electronics Superstore, Aviation Blvd./Utah Ave., El Segundo	152,504 ft <sup>2</sup>	Commercial <sup>(4)</sup>	0.0029	446
7	2151 E. Grand Ave., El Segundo	125,000 ft <sup>2</sup>	Office Building	0.0001	12.5
8	455/475 Continental Blvd., El Segundo	530,000 ft <sup>2</sup>	Three Office Buildings and One R&D Center	0.0001	53.0
9	2201 Highland Ave., Manhattan Beach	1,600 ft <sup>2</sup>	Retail/Restaurant <sup>(4)</sup>	0.0029	4.68
		1,600 ft <sup>2</sup>	2 DU Condominium	N/A	1.84
10	1300 Highland Ave., Manhattan Beach	15,000 ft <sup>2</sup>	Commercial/Office	0.0001	1.5
11	NE corner of Sepulveda Blvd. & Marine Ave., Manhattan Beach	52,174 ft <sup>2</sup>	Commercial <sup>(4)</sup>	0.0029	152.68
12	2200 Sepulveda Ave., Manhattan Beach	29,000 ft <sup>2</sup>	Medical Offices	0.0001	2.9
14	1100 Manhattan Beach Blvd., Manhattan Beach	13,396	Retail <sup>(4)</sup>	0.0029	39.2
<b>Cumulative Solid Waste Increase:</b>					<b>9,921.70</b>

- (1) Source: Los Angeles World Airports, 2001
- (2) Single condominium units
- (3) Tons per day per dwelling unit (du)
- (4) Assumes 530 ft<sup>2</sup> per employee

cumulative disposal needs is the responsibility of local, county, and state solid waste management agencies and may become available as these agencies develop solutions to meet the future disposal needs at a regional level (e.g., expanding existing landfills, transporting waste to other landfills, converting waste to energy, recycling and waste reduction.) The related projects would be subject to the source reduction and recycling requirements established by the local jurisdiction in accordance with AB939 (e.g., divert 50 percent of the solid waste generated from landfills through waste reduction, recycling,

and composting). The cumulative projects would be required to participate in recycling programs, reducing the amount of solid waste sent to landfills for disposal. The Chevron Refinery implements a source reduction and recycling program to minimize solid wastes generated at the Refinery. Because the proposed project's contribution to solid and hazardous waste impacts is not cumulatively considerable, the cumulative impacts on solid/hazardous waste are not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130).

### **5.7.2 MITIGATION MEASURES**

No mitigation measures are required for the Chevron PRO Project because the impacts are less than significant. Chevron will continue to implement a source reduction and recycling program to minimize solid wastes generated at the Refinery. New development must comply with all applicable city, county, state, and federal requirements regulating solid waste disposal. Cumulative impact mitigation is the responsibility of local regional and state agencies and mitigation measures are limited to source reduction measures.

### **5.7.3 LEVEL OF SIGNIFICANCE AFTER MITIGATION**

Individual project impacts on hazardous and solid waste impacts from the Chevron PRO Project are less than significant and, therefore, not cumulatively considerable for the reason that all cumulative impacts are within existing capacity of landfills.

## **5.8 TRANSPORTATION/TRAFFIC**

### **5.8.1 CONSTRUCTION IMPACTS**

Traffic impacts associated with the construction of the Chevron proposed project are expected to be potentially significant during the evening peak hour at one intersection, Aviation Boulevard/El Segundo Boulevard and on portions of the I-105 and I-405 freeways. Therefore, the proposed project may have cumulative traffic impacts with other projects in the area. The proposed project's contribution to cumulative impacts on traffic during the construction phase would be considered cumulatively considerable.

There could be cumulative construction traffic impacts associated with other industrial construction projects in the area that do not avoid peak traffic hours. However, the Chevron PRO Project is expected to provide the major portion of the traffic related to construction activities, so cumulative construction impacts on traffic from these projects are considered significant.

### **5.8.2 OPERATIONAL IMPACTS**

Table 5-13 shows the projected LOS analysis and volume to capacity ratios due to general growth in the area (see Appendix F for details). The cumulative traffic analysis

TABLE 5-13

**Chevron El Segundo Refinery Cumulative Traffic Impacts  
Level of Services Analysis and Volume-to-Capacity Ratios**

INTERSECTION	BASELINE <sup>1</sup>		IMPACTS		
	PM LOS	Peak Hour V/C	PM LOS	Peak Hour V/C	Change in V/C
Sepulveda (SR1) and El Segundo Blvd.	F	1.104	F	1.167	+0.063*
Sepulveda (SR1) and Rosecrans Ave.	F	1.070	F	1.131	+0.061*
Sepulveda (SR1) and Imperial Hwy.	C	0.718	C	0.758	+0.040
Aviation Blvd. and El Segundo Blvd.	E	0.968	F	1.023	+0.055*
Aviation Blvd. and Rosecrans Ave.	D	0.804	D	0.853	+0.049*
La Cienega Blvd. and I-405 SB on/off	B	0.609	B	0.642	+0.033
La Cienega Blvd. and El Segundo Blvd.	B	0.677	C	0.715	+0.038
I-405 SB on and El Segundo Blvd.	B	0.634	B	0.669	+0.035
I-405 NB on/off and El Segundo Blvd.	A	0.535	A	0.564	+0.029
I-405 SB off and Rosecrans Ave.	B	0.628	B	0.663	+0.035
I-405 NB on/off and Rosecrans Ave.	B	0.618	B	0.652	+0.034
I-405 SB on/off and Hindry Ave.	A	0.541	A	0.570	+0.029
California St. and Imperial Hwy.	A	0.486	A	0.512	+0.026
Main St. and Imperial Hwy.	B	0.639	B	0.674	+0.035
Continental and Grand Ave.	A	0.277	A	0.291	+0.014
Continental and Mariposa Ave.	A	0.415	A	0.437	+0.022
Nash St. and Mariposa Ave.	A	0.344	A	0.361	+0.017
Douglas St. and Mariposa Ave.	A	0.482	A	0.508	+0.026
Douglas St. and Atwood Way	A	0.301	A	0.316	+0.015

\* Potentially significant cumulative impact from other projects.

(1) Year 2008, see Table 3-12.

assumed that the ambient traffic growth rate in the city is 0.50 percent per year from year 2008 to year 2020 and no changes in existing intersection geometrics.

Cumulative impacts are not expected to result in a significant impact at the following intersections:

- Sepulveda Boulevard (SR1) and Imperial Highway;
- La Cienega Boulevard and I-405 SB on/off ramps;
- La Cienega Boulevard and El Segundo Boulevard;
- I-405 SB on-ramp and El Segundo Boulevard;
- I-405 NB on/off ramp and El Segundo Boulevard;

- I-405 SB off-ramp and Rosecrans Avenue;
- I-405 NB on/off and Rosecrans Avenue;
- I-405 SB on/off and Hindry Avenue;
- California Street and Imperial Highway;
- Main Street and Imperial Highway;
- Continental Boulevard and Grand Avenue;
- Continental Boulevard and Mariposa Avenue;
- Nash Street and Mariposa Avenue;
- Douglas Street and Mariposa Avenue; and,
- Douglas Street and Atwood Way.

On a cumulative basis, general growth in the area unrelated to Chevron’s proposed PRO project may result in significant traffic impacts at the intersections of:

- Sepulveda Boulevard (SR1) and El Segundo Boulevard;
- Sepulveda Boulevard (SR1) and Rosecrans Avenue;
- Aviation Boulevard and El Segundo Boulevard; and,
- Aviation Boulevard and Rosecrans Avenue.

The increase in traffic is unrelated to the proposed project but is related to general population growth in the area so mitigation measures will need to be developed as new projects that generate traffic are proposed and as part of the City of El Segundo’s and Manhattan Beach’s General Plan process.

### **5.8.3 MITIGATION MEASURES**

The Chevron project construction traffic is expected to be mitigated by avoiding starting the work shifts during the morning peak traffic hours, but the evening peak hours cannot be avoided. Chevron will encourage ride-sharing by construction workers to minimize construction traffic impacts. In addition, different parking areas will be used with construction workers being bussed into the Refinery so that traffic impacts will be dispersed throughout the area.

No mitigation measures are required for the operational phase of the Chevron PRO Project as no significant project-specific impacts are expected. Cumulative operational impacts, however, are significant (Table 5-13). Mitigating the cumulative traffic impacts are typically implemented through local jurisdictions by payment of fair share traffic fees that are used to upgrade/reconfigure intersections to improve traffic flow. Improved timing of signals and widening intersections can also reduce traffic impacts and improve traffic flow.

### **5.8.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION**

The proposed project is expected to result in significant traffic impacts during the construction phase, even after mitigation. The Chevron PRO Project construction traffic

## CHAPTER 5: SUMMARY OF CUMULATIVE IMPACTS

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impacts are cumulatively considerable, even after mitigation. However, the construction activities are expected to cease following completion of the proposed project so no long term significant traffic impacts are expected.

Individual project impacts on transportation and traffic from the operation of the Chevron PRO Project are less than significant. Because the proposed project's contribution to traffic impacts during project operations is not cumulatively considerable, the cumulative impacts on traffic are not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130).

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