Draft

Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey (A.99-05-029)

Environmental Impact Report

SCH# 2003091003

June 4, 2004

Prepared for

California Public Utilities Commission
Energy Division
505 Van Ness Avenue, 4th Floor
San Francisco, CA 94102-3298

PUBLIC UTILITIES COMMISSION
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To: **Interested Parties – Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey (A.99-05-029)**

From: **Michael Rosauer, EIR Project Manager**

Subject: **Notice of Availability, Draft Environmental Impact Report for Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey (A.99-05-029)**

Date: **June 4, 2004**

The California Public Utilities Commission (CPUC) has prepared a Draft Environmental Impact Report (DEIR) under the California Environmental Quality Act (CEQA) for consideration of Southern California Gas Company's (SCG) Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey, California. This proposed project consists of the proposed sale of 36 lots located within Marina del Rey and Playa del Rey and the reasonably foreseeable future development of these lots that would result from the proposed sale. For this project, the reasonably foreseeable future development that would result from the proposed sale includes the construction and occupancy of residential housing units, as well as commercial uses. The DEIR details the proposed sale and evaluates and describes the potential environmental impacts associated with the sale and its reasonably foreseeable future development, identifies those impacts that could be significant, and presents mitigation measures, which, if adopted by the CPUC or other responsible agencies, could avoid or minimize these impacts. The DEIR also evaluates alternatives to the proposed project, including the No Project Alternative, as required by CEQA. The DEIR was released for public review on June 4, 2004. The DEIR will be available for review at the Marina del Rey Library, the Westchester – Loyola Village Branch Library, and on the project website, as listed at the bottom of this notice. Copies of the DEIR on CD may be requested by phone at (415) 703-2579 or by e-mail at playadivest@esassoc.com. The CPUC also has a limited number of copies of the complete DEIR document available for public review upon request at the CPUC offices at 320 West 4th Street, Suite 500, Los Angeles, CA 90013, or at 505 Van Ness Avenue, San Francisco, CA 94102.

Written comments on the Draft EIR must be postmarked or received by fax or e-mail no later than Monday, July 19, 2004; please be sure to include your name, address, and telephone number. Written comments on the Draft EIR should be sent to:

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NOTICE OF PUBLIC HEARING

A public hearing for this project will be held on *Monday, June 28, 2004* at *7:00 p.m.* at the *Westchester Municipal Building Community Room, located at 7166 W. Manchester Street, Los Angeles, California.*

SOURCES OF PROJECT INFORMATION

To read the Draft EIR online, go to the Internet website at: http://www.playadivest.com.
This site will be used to post all public documents during the environmental review process and to announce any upcoming public meetings. You may also contact the EIR team by phone, fax, e-mail, or postal mail using the numbers and information above.

SCG'S APPLICATION TO VALUE AND SELL SURPLUS PROPERTY AT PLAYA DEL REY AND MARINA DEL REY INFORMATION REPOSITORIES

Lloyd Taber-Marina del Rey Library 4533 Admiralty Way Marina Del Rey, CA 90292	Westchester - Loyola Village Branch Library 7114 W. Manchester Ave. Los Angeles, CA 90045	California Public Utilities Commission 320 West 4th Street, Suite 500 Los Angeles, CA 90013	California Public Utilities Commission 505 Van Ness Avenue San Francisco, CA 94102

REMINDER: Draft EIR comments will be accepted by fax, e-mail, or postmark through July 19, 2004. Please be sure to include your name, address, and telephone number.

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202639

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EXECUTIVE SUMMARY

SOUTHERN CALIFORNIA GAS COMPANY'S APPLICATION TO VALUE AND SELL SURPLUS PROPERTY AT PLAYA DEL REY AND MARINA DEL REY (A.99-05-029) DRAFT ENVIRONMENTAL IMPACT REPORT

INTRODUCTION

Southern California Gas Company (SCG), in its California Public Utilities Commission (CPUC) application (A.99-05-029), proposes a sale of surplus SCG property in PDR and MDR. Under Public Utilities Code 851, review and approval of the proposed sale must comply with the California Environmental Quality Act (CEQA) in order to assess the potential environmental impacts of the proposed project. Accordingly, under CEQA Guidelines 15378(a), a "project" is defined as: [1] "the whole of an action, which has the potential for resulting in either a direct physical change in the environment, or [2] a reasonably foreseeable indirect physical change in the environment…" Therefore, this Environmental Impact Report (EIR) is approached using a two-pronged analysis considering the environmental impacts that would result from [1] the sale of the 36 lots that comprise these properties; as well as, [2] impacts of the reasonably foreseeable future development of these lots that would result from the proposed sale. This EIR focuses on analyzing the environmental impacts of the following issues relating to the project.

- The sale itself, transfer of property ownership of the 36 Playa del Rey and Marina del Rey lots from SCG to new owners, would not directly result in any significant environmental impacts.

- The EIR analyzes the impacts of reasonably foreseeable future development of urban land uses consistent with existing zoning and adjacent land uses that would result from the sale of these lots. For this project, the reasonably foreseeable future development that would result from the proposed sale includes the construction and occupancy of residential housing units, as well as commercial uses.

The CPUC is the lead agency for this project and is responsible for compliance with CEQA. An Initial Study for this project was conducted and released for public review on September 3, 2003. The Initial Study concluded that, although no direct significant environmental impacts would result from the sale of the lots, the reasonably foreseeable future development of urban land uses, consistent with existing zoning and adjacent land uses, could result in significant environmental impacts to air quality, biological resources, cultural resources, geology and soils, public health, public safety, hydrology and water quality, noise, transportation and traffic, and utilities and

service systems. Therefore, this Draft EIR had been prepared to further analyze these potential impacts.

As described in this EIR, the sale of the project lots would not result in any direct environmental impacts. The CPUC (the lead agency for this project) would not have jurisdictional control over the lots after the proposed sale has been completed. Therefore, the CPUC would not have the authority to impose and/or enforce mitigation measures associated with the construction and occupancy of future buildings on the lots. However, this EIR discloses the environmental impacts that would be expected to result from the future development of the lots and recommended mitigation measures, which if implemented by other responsible agencies (i.e., City of Los Angeles), could avoid or minimize these significant environmental impacts.

Because reasonably foreseeable potential impacts have been identified associated with future development of the 36 lots proposed for sale, based on their present land use designations (residential development, except for Cluster 5, which is designated for limited commercial use) the CPUC should consider these potential environmental impacts when certifying the Final EIR for potential approval of the proposed sale. Accordingly, this EIR recommends mitigation measures that could and should be applied by other responsible agencies during subsequent environmental review and approval processes for future development projects as they occur.

Copies of the Draft/Final EIR will be distributed by the CPUC to all responsible agencies for consideration in subsequent environmental review for the future development of these lots. This EIR provides a comparison of the environmental effects of the proposed sale and the alternatives, noting the two pronged analysis of the sale and the future development, and identifies an environmentally superior alternative.

With implementation of recommended mitigation measures identified throughout Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*, impacts related to air quality, biological resources, cultural resources, geology and soils, hydrology and water quality, noise, transportation and traffic, and utilities and service systems would be less than significant.

This EIR is an informational document only and does not make a recommendation regarding the approval or denial of the proposed sale. The purpose of the EIR is to inform the public on the environmental setting and potential impacts of the proposed sale and its alternatives. The EIR will be used by the CPUC in conducting the proceeding to determine whether to authorize SCG's requested sale.

ALTERNATIVES

CEQA Guidelines 15126.6(a) requires that a range of reasonable alternatives to the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any significant effects of the project, be discussed in an EIR. This EIR identified and analyzes such a range of alternatives; discusses the environmental effects of each alternative;

compares the environmental effects of each alternative with existing conditions and with impacts of the proposed project; and addresses the relationship of each alternative to the project objectives. The alternatives evaluated in this EIR consist of the following:

- Alternative 1: No Project - the lots proposed for sale by SCG would not be sold. As none of the lots would be sold, the future connected action that would result from the sale of the lots (residential and some commercial development) would also not occur. SCG would maintain ownership of the 36 lots; the site characteristics would remain in their existing conditions.

- Alternative 2: Partial Sale – Exclude Cluster 9 to avoid potential adverse impacts to the monarch butterfly habitat. Under this alternative, the CPUC would authorize the sale of all of the lots except the lots contained in Cluster 9.

- Alternative 3: Partial Sale – Exclude Cluster 12 to avoid potential adverse impacts to the globose dune beetle habitat. Under this alternative, the CPUC would authorize the sale of all of the lots except the lots contained in Cluster 12.

Of the alternatives assessed in this EIR, the alternative with the least environmental impact would be the No Project Alternative. Section 15126.6(e)(2) of the CEQA Guidelines states that if the environmentally superior alternative is the no project alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. Among the other alternatives, Alternatives 2 and/or 3 would be the environmentally superior alternatives.

PROJECT DESCRIPTION

SCG has submitted its application to the CPUC to sell surplus land associated with 36 undeveloped lots in PDR and MDR with an approximate total acreage of 4.7 acres. All of the lots proposed for sale overlie the existing SCG PDR Gas Storage Field, which lies approximately 6,000 feet below ground surface and had an extensive history of oil exploration and extraction activity during the 20th century. The general project area is approximately four miles south of the city of Santa Monica, 1.5 miles north of the Los Angeles International Airport, five miles west of Culver City, and is bordered by Santa Monica Bay to the west. PDR is located within the city of Los Angeles, and MDR is located within the county of Los Angeles. MDR is approximately two miles northwest of PDR, separated by the Ballona Wetlands and the MDR Channel. A general project location is shown on **Figure S-1**.

The 34 undeveloped lots proposed for sale located in PDR are grouped into eleven lot clusters (Clusters 1 to 11) consisting of one to eight lots per cluster, as shown in **Figure S-2**. The two MDR lots represent a single cluster (Cluster 12) and are located approximately two miles north of PDR as shown in **Figure S-3**. SCG proposes to sell these lots “as-is” without any requirements for future development on the lots; however, subsurface and mineral rights would be retained by SCG and would not be included in the sale. Twelve of the 36 lots contain an abandoned gas well; these gas wells were once used by SCG as observation or monitoring wells for the PDR Gas

Storage Facility. Per A.99-05-029, between 1998 and 1999 SCG conducted an open process sealed bid sale of these undeveloped lots and has selected four different, already-approved buyers. Sales agreements presented in A.99-05-029 anticipate that one buyer would purchase a single lot (Cluster 5), while the other three would acquire blocks of the remaining 35 lots.

SCG has identified three project objectives associated with the proposed sale of the 36 lots. These project objectives include:

- To remove SCG assets no longer necessary for public utility service – Since SCG has declared these properties as neither "necessary or useful" to its PDR gas storage operations, they are now considered to be surplus properties.
- To return these assets to the public – by accomplishing divestiture of these assets, the properties would be returned to the public for other uses.
- To provide a benefit to ratepayers – After divestiture, ratepayers would no longer be assessed for SCG's ownership and stewardship of these surplus properties.

POTENTIAL ENVIRONMENTAL RISKS

While the sale of the lots itself would not present any direct significant environmental impacts, reasonably foreseeable future development of the lots could result in environmental impacts. Potential environmental risks could occur from the development of the 36 lots proposed for sale due to the lots' history of oil and gas exploration and extraction operations as well as the potential for methane gas migration from any leaking abandoned gas wells. Future development of the lots could reasonably consist of residential development (except for one lot which is zoned commercial), which is consistent with the present land use in the area. Using previously documented scientific information and data gathered from additional field investigations of onsite conditions conducted for this EIR; consideration of these future impacts and associated risks are examined in detail in this EIR.

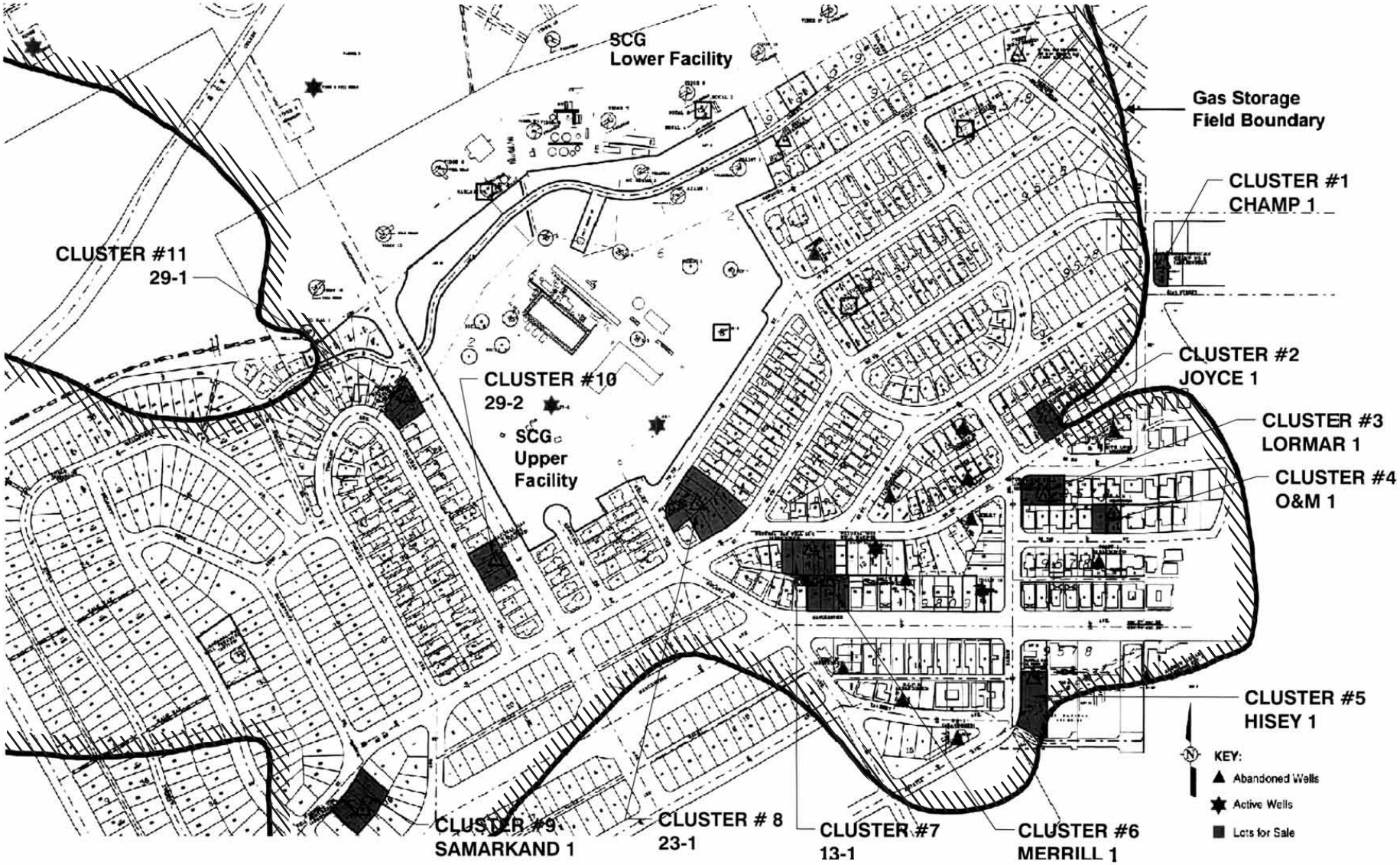
FIELD INVESTIGATIONS OF EXISTING SITE RISKS

Beginning in 2000, an initial field monitoring study was performed at two lot clusters (Clusters 3 and 12) to assess the potential effects of methane migration on sensitive receptors that could be caused by future development of the 36 lots proposed for sale. While this initial testing concluded that subsurface migration was not occurring, it also concluded that the two lots where testing occurred could not be considered indicative of all 12 clusters. Therefore, additional

SOURCE: Environmental Science Associates

Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey Project / 202639

Figure S-1
Aerial Map of Project Area

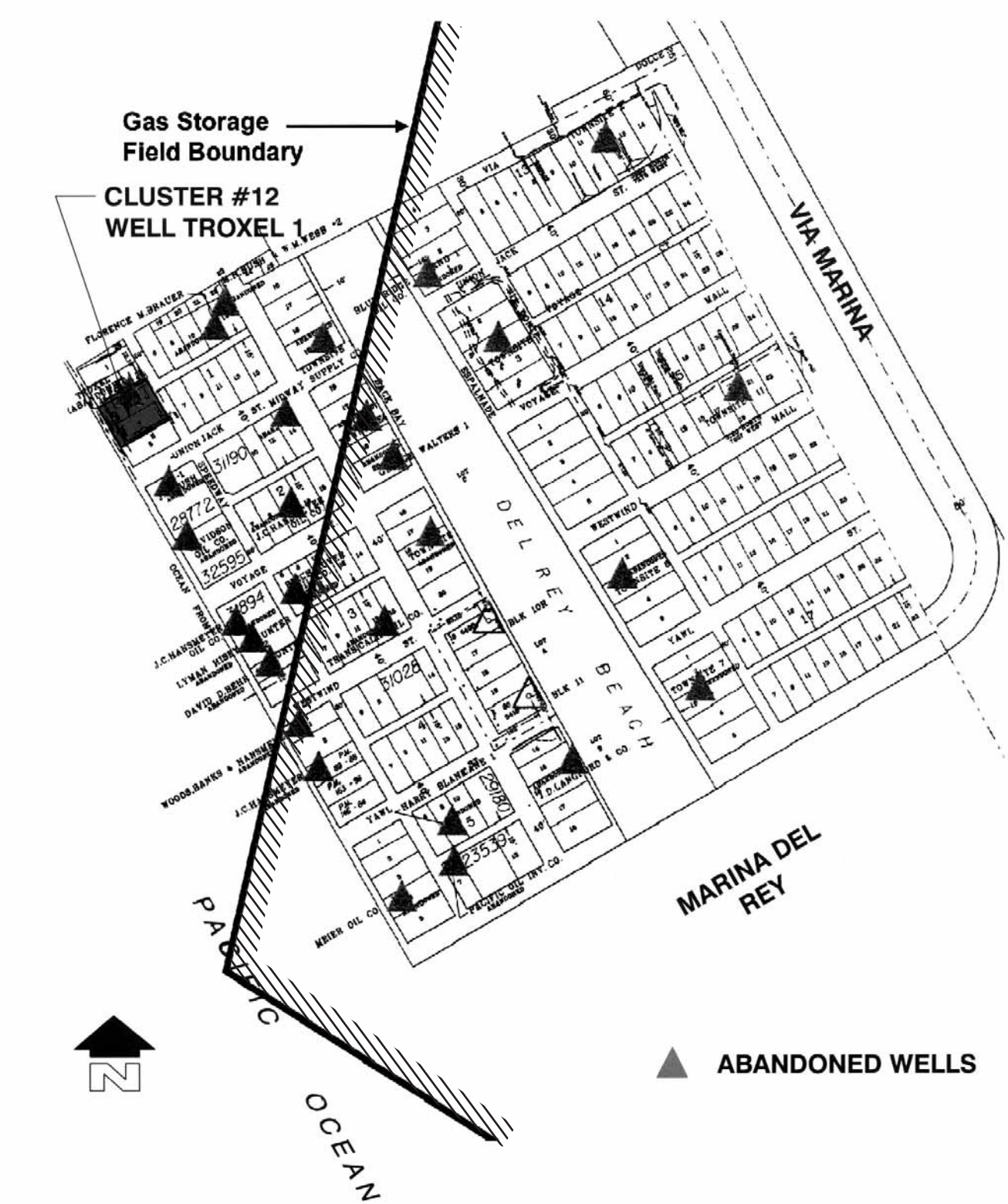


SOURCES: Environmental Science Associates, Southern California Gas Company

Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey Project / 202639

Figure S-2

Annotated Site Map - Playa del Rey



SOURCES: Environmental Science Associates, Southern California Gas Company

Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey Project / 202639

Figure S-3

Annotated Site Map - Marina del Rey

testing (including testing for methane, soil contamination, and soil gas) of the lots was performed; the results of which are described in further detail in Sections 4.E, *Geology*, 4.F, *Public Health*, and 4.G, *Public Safety*. Health hazards associated with impacts from potential gas migration are analyzed in Section 4.F, *Public Health*. Methane field testing showed that the combustible gas concentrations were generally non-detectable at each cluster and that no significant odors (olfactory) were detected at any cluster during the monitoring periods.

During the final round of field investigations, conducted in 2003, testing was performed to identify any toxic substances that could be present at the 36 lots proposed for sale. A total of 86 soil samples, 231 vapor soil samples, and 21 groundwater soils were taken as part of this sampling analysis. Total petroleum hydrocarbons (TPH) were measured in the soil and in the soil vapor at the 36 lots proposed for sale, and the toxic components of TPH were identified. Based on these field investigations, a Human Health Risk Assessment (HHRA) was prepared to evaluate the findings of the field data investigations.

HUMAN HEALTH RISK ASSESSMENT

A Human Health Risk Assessment (HHRA) for the 36 lots proposed for sale was completed in March 2004. The HHRA evaluated the potential human health risks associated with chemicals detected in various field data collection studies conducted by consultants for the CPUC Energy Division between 2000 and 2003. An HHRA is a formal process that combines information on how people could come into contact with chemicals (exposure) with information on the health effects of the chemicals (toxicity). This combined information is used to estimate the likelihood of an adverse health effect. Soil and groundwater samples were tested and evaluated for the presence of total petroleum hydrocarbons (TPH), the volatile organic chemicals including benzene, toluene, ethylbenzene, and xylene, and semivolatile organic chemicals, because cancer and noncarcinogenic risks could result from the chemicals if present in the soils at the 36 lots proposed for sale.

The California Environmental Protection Agency (Cal/EPA) and the United States Environmental Protection Agency (U.S. EPA) has established the range for acceptable cancer risks to be between one in ten thousand (1 in 10,000) to one in one million (1 in 1,000,000)[1] depending on the type of human interaction with the affected area. Therefore cancer risk levels higher than 1 in 10,000 represent unacceptable risks to human health, while risks between 1 in 10,000 to 1 in 1,000,000 may be considered acceptable depending on the situation. Cancer risks below 1 in 1,000,000 are generally considered to be negligible. CEQA Guidelines for several air districts in the state of California, such as the Bay Area Air Quality Management District, recommend a significance threshold of 10 in 1,000,000. Furthermore, Proposition 65, otherwise know as The Safe Drinking Water and Toxic Enforcement Act of 1986, defines the “no significant risk” level

[1] For example, a cancer risk of one in one million means that the evaluated risk has the probability of causing one additional case of cancer in one million cases directly as a result of the evaluated risk.

as the level that is calculated to result in not more than one excess case of cancer in 100,000 individuals exposed over a 70-year lifetime.

Noncarcinogenic health effects are expressed as a ratio between the daily intake and the reference dose. This ratio is referred to as the hazard index. The reference dose is defined as a level of daily exposure that is unlikely to result in noncarcinogenic adverse health effects over a lifetime of exposure. Hence, hazard index values that are greater than one indicate that exposure is greater than the recommended level; while hazard index values that are less than one show that exposure is lower than the recommended level.

Overall, the HHRA conservatively estimated probability of an increased incidence of cancer for the residential future use of the 36 lots proposed for sale, assuming 30-year exposure to the maximum chemical concentration found in any sample at any of the lots, is 0.4 in 1,000,000 with a noncarcinogenic hazard index of 0.6. The estimated cancer risk level is less than one half the lowest level of no-significant risk of 1 in 1,000,000 set by Cal/EPA and the U.S. EPA as well as being below the CEQA level of significance 10 in 1,000,000. Furthermore, the estimated hazard index (0.6) is well below recommended levels (1.0). **Table S-1** shows cancer and hazard risks associated with the 36 lots. As is presented in the discussion of Impact F.1, Section 4.F, *Public Health*, the health risks of the properties to local residents (sensitive receptors) is less-than-significant.

TABLE S-1
PROJECT CANCER AND RISK HAZARDS

Exposure Pathway	Cancer Risk[a]	Hazard Index[b]
Contact with Soil (Ingestion and Dermal)	9 in 10 billion (9×10^{-10})	0.09
Inhalation of Outdoor Air	2 in 1 billion (2×10^{-9})	0.06
Inhalation of Indoor Air	4 in 10 million (4×10^{-7})	0.5
TOTAL	**4 in 10 million (4×10^{-7})**	**0.6**

a – The cancer risk significance threshold is 1 in 1 million (1×10^{-6})
b – The hazard index significance threshold is 1.0

SOURCE: Brown and Caldwell (2004)

METHANE HAZARDS

All of the 36 lots proposed for sale are located within an area designated as a “methane zone” by the City of Los Angeles. In 2003, as part of the overall field testing, a methane hazards analysis study was conducted on the lots proposed for sale. The analysis found that 35 of the lots were

free of methane in the soil gas monitoring probes and thus free of methane hazards. However, one lot on Cluster 11 had elevated levels of methane soil gas in the probes.

The lower explosive limit of methane gas is generally considered to be 5 percent methane in the air. This is equivalent to 50,000 parts per million (ppm) by volume. The upper explosive limit, above which methane will burn, but not explode, is generally considered to be approximately 15 percent methane by volume (150,000 ppm) depending upon the composition of the balance of the atmosphere. If there is enough methane to significantly displace oxygen in the air, it can cause suffocation in living beings. Methane gas can explode in inhabited structures or confined spaces if the methane is above the lower explosive limit, is present in a confined space (such as a basement), and there is a source of ignition. In addition, explosion can result when soil gas enters dry utility conduits or vaults.

From July 2003 to December 2003, monthly measurements for total volatile organics, methane, oxygen, and hydrogen sulfide at shallow and deep probes on the 36 lots proposed for sale were taken. No hydrogen sulfide was found at any of the testing sites at any time. Methane readings were all non-detect except at Cluster 11 and Cluster 12. At the Cluster 11 site, elevated levels of methane were consistently found, from a minimum of 11.5 percent to a maximum of 35 percent by volume. Additional analysis of the Cluster 11 methane was conducted to determine if the specific source of the observed methane could be inferred. Laboratory analysis of the helium content of the methane showed no evidence of any SCG PDR Facility storage gas. Methane at Cluster 11 may be related to residual soil contamination at depth, remaining from previous oilfield activities and not from any leak of the abandoned SCG gas well. At the Cluster 12 site, a single methane transient of 2.2 percent by volume was detected in July 2003 during installation of a borehole on site. However, subsequent samplings at the same location failed to detect any further elevated levels of methane at Cluster 12.

The presence of methane gas can either be remediated (source removal) or mitigated (venting of gas and interruption of pathways). Some source removal has already occurred at the 36 project lots as part of the well abandonment and site remediation performed by SCG. With the exception of Cluster 11, all of the clusters' most recent measured soil gas concentrations were negligible. Field monitoring data suggest that structures placed on Cluster 11 would most likely be safe from methane hazards due to compliance with California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) requirements for proper well abandonment already having been performed by SCG for all wells considered in the proposed sale. Developers of future development of these 36 lots proposed for sale would be required to implement methane protection measures for utility conduits and recently adopted (2004) City of Los Angeles requirements.

The new City of Los Angeles Building Code (Ordinance No. 175790) expands the official methane zone from the older, more limited Fairfax Area to include all lands in the city overlying oil fields, plus a substantial buffer zone around the oil fields. These codes would apply to the 36 lots proposed for sale. The City code describes required mitigation measures for all structures in

potential soil gas areas, whether gas is present or not. For areas where gas is present, additional measures are required, including soil gas venting, constructing barriers to interrupt gas migration pathways, and, in cases where gas is present, monitoring gas in the soil and at structures.

SUMMARY OF PUBLIC HEALTH AND METHANE SAFETY IMPACTS

Based on field measurement data taken over several years at the 36 lots proposed for sale and risk estimates from the HHRA, no significant risk to public health (see Table S-1) would be expected from the sale or from potential future development of these lots. Similarly, field measurements of methane show that no significant safety risks exist from methane with the exception of one lot at Cluster 11 which could have a potential risk for future occupation of the property. However, the recently enacted changes to the City of Los Angeles Building Code (Ordinance No. 175790) provide mitigation measures designed to provide sufficient mitigation for this potential future risk. These measures include the installation of membrane barriers and vent piping as well as trench dams and electrical seal offs for each property.

MITIGATION AND MONITORING

Under CEQA guidelines, this Environmental Impact Report (EIR) is approached using a two-pronged analysis considering both the environmental impacts that would result from [1] the sale of the 36 lots that comprise these properties; as well as, [2] the reasonably foreseeable future development of these lots that would result from the sale. Mitigation and monitoring is approached in a similar manner. Accordingly, in certification of this EIR, the CPUC identifies enforceable mitigation measure associated with the sale of the project; as well suggested mitigation measures to be considered by other agencies during future environmental review associated with the future development of these 36 lots.

MITIGATION MEASURES FOR THE PROPOSED SALE

As is stated in the EIR, the transfer of property ownership of the 36 Playa del Rey and Marina del Rey lots from SCG to new owners, would not directly result in any significant environmental impacts. The proposed sale was also evaluated for the necessity to require SCG to provide complete disclosure of existing site conditions and/or other related documents to the four future buyers of the lots as mitigation measures associated with the sale and required in this EIR. Future buyers have already been provided with a substantial amount of information on the lots by SCG. This information will be further supplemented by this environmental review document as well as documents from the supporting field investigation data. Therefore, because the information provided by SCG and by this document are believed to comprise full disclosure of existing site conditions including environmental documentation and supporting scientific information, no mitigation measures are required for the proposed sale.

RECOMMENDED MITIGATION MEASURES FOR FUTURE DEVELOPMENT

The EIR considered the reasonably foreseeable impacts resulting from future development of the lots proposed for sale based on their existing land use designations. Accordingly, a set of recommended mitigation measures is presented in the EIR for consideration by other agencies during future environmental review of the future development of the lots. These mitigation measures address two aspects of future development: construction and occupation of the properties.

CONSTRUCTION MITIGATION MEASURES

- Air Quality - measures are provided to control dust and carbon monoxide from construction equipment and construction-related traffic.

- Biology – measures require surveys of raptor and other nesting bird species at the lots. At Cluster 9 surveys are required to determine if monarch butterflies are present during the winter prior to the start of construction or onsite tree removal. At Cluster 12, surveys for globose dune beetles are required prior to construction. Additionally, measures for compensation of loss of habitat are provided.

- Cultural Resources – measures are provided that specify action should an accidental discovery of archaeological or paleontological artifacts be made.

- Geology and Soils – measures require that a site-specific design level geotechnical investigation for each building be conducted and that full seismic considerations be given to future structures.

- Noise – measures require limits of operation of construction equipment, use of construction equipment with noise control measure incorporated, and a system for instruction to contractors about noise control and a complaint reporting system.

- Transportation and Traffic – measure requires construction contractors to implement measures such as limiting the transport of construction materials and equipment to off-peak traffic periods, as required by the City of Los Angeles.

FUTURE DEVELOPMENT OPERATIONS MEASURES

- Hydrology and Water Quality – measure requires that future developers prepare a drainage plan for each site and submit it with the building permit application, as required by the City of Los Angeles Public Works Department.

- Transportation and Traffic – measure requires that a trip generation study be performed for the commercial lot (Cluster 5) to determine impacts on local traffic as well as to insure that Cluster 5 is provided with adequate parking.

CHAPTER 1
INTRODUCTION

1.1 PURPOSE OF THIS EIR

This Environmental Impact Report (EIR) has been prepared by the California Public Utilities Commission (CPUC) pursuant to the applicable provisions of the California Environmental Quality Act (CEQA) and its implementing guidelines (CEQA Guidelines). The CPUC is the lead agency for this EIR, which examines the overall effects of Southern California Gas Company's (SCG) Application (A.99-05-029) for authorization under Public Utilities Code Section 851 to Sell Surplus Property at Playa del Rey (PDR) and Marina del Rey (MDR) (referred to throughout this document as the "project," "proposed sale," or "proposed project") for the 34 lots in PDR and 2 lots in MDR (referred to throughout this document as the "project site" or "project area"), located in the city of Los Angeles, California.

An Initial Study, which analyzed the foreseeable consequences of the project, was completed for in September 2003. This study determined that although the actual sale of the property has little or no environmental consequences, it is reasonable foreseeable that there could be potentially significant impacts in the areas of air quality, biological resources, cultural resources, geology and soils, public health, public safety, hydrology and water quality, noise, transportation and traffic, and utilities and service systems resulting from the connected action of the development of urban land uses consistent with existing zoning and adjacent land uses. The Initial Study also found that impacts to aesthetics, agricultural resources, energy, land use, mineral resources, population and housing, public services, and recreation would be less than significant; therefore, these environmental topic areas are not further addressed in this EIR. CEQA requires that, before a decision can be made to approve a project with potentially significant environmental effects, an EIR must be prepared that fully describes the environmental effects of the project. The EIR is a public informational document for use by governmental agencies and the public. It is intended to identify and evaluate potential environmental consequences of the proposed project, to identify mitigation measures that would lessen or avoid significant adverse impacts, and to examine feasible alternatives to the project. The information contained in the EIR is reviewed and considered by the lead agency prior to its action to approve, disapprove, or modify the proposed project.

CEQA states that the lead agency, the CPUC, shall neither approve nor implement a project as proposed unless the significant environmental effects of that project have been reduced to a less-than-significant level and all feasible mitigation measures have been imposed, essentially "eliminating, avoiding, or substantially lessening" its expected impacts. If the lead agency approves the project despite residual significant adverse impacts that cannot be mitigated to less-

than-significant levels, the agency must state the reasons for its action in writing. This "Statement of Overriding Considerations" must be included in the record of project approval.

This EIR has been prepared to inform the CPUC, responsible agencies, trustee agencies, and the public of the proposed project's environmental effects. The EIR is intended to publicly disclose those impacts that may be significant and adverse, describe the possible measures that would mitigate or avoid such impacts, and describe a reasonable range of alternatives to the project. Figures depicting the proposed project are contained herein; although necessarily conceptual in nature, these figures illustrate the major characteristics of the project.

1.2 PROJECT OVERVIEW

SCG has submitted its application to the CPUC to sell surplus land associated with 36 lots in PDR and MDR with an approximate total acreage of 4.7 acres. The 34 undeveloped lots located in PDR are grouped into eleven lot clusters of one to eight lots. The two MDR lots represent a single cluster and are located approximately two miles north of PDR. SCG proposes to sell the lots "as-is" without any requirements for future development on the lots. Subsurface and mineral rights would be retained by SCG and would not be included in the sale. Twelve of the lots each contain an abandoned gas well. These twelve abandoned wells were once used by SCG as observation or monitoring wells for SCG's PDR Gas Storage Facility. Under the proposed sale, SCG would sell these undeveloped lots to four different already-approved buyers. It is anticipated that one buyer would purchase a single lot, while the other three would acquire the remaining 35 lots.

1.3 APPROACH TO ANALYSIS

As explained more fully in Section 4a, *Approach to Analysis*, the project itself, transfer of property ownership of the 36 PDR and MDR lots from SCG to new owners, would not directly result in any significant environmental impacts. However, this EIR analyzes the reasonably foreseeable associated impacts of development of urban land uses consistent with existing zoning and adjacent land uses, resulting from the sale of these lots.

In order to be able to accurately assess the potential environmental impacts of the proposed sale and its reasonably foreseeable future development, a series of studies were conducted. **Table 1-1** provides a chronological summary of the studies that were conducted; the results of which were used to evaluate potential environmental impacts in this Draft EIR. The results of these studies are further explained in Sections 4.E, *Geology and Soils*, 4.F, *Public Health*, and 4.G, *Public Safety*.

While the CPUC, the lead agency for the project, does not have the authority to impose and enforce mitigation measures associated with the construction and occupancy of possible future buildings on the lots, this EIR identifies potential impacts that could occur and provides recommended mitigation measures that could and should be applied by other responsible agencies during subsequent environmental review and approval processes for specific future projects on the lots proposed for sale as they occur.

TABLE 1-1
CHRONOLOGICAL SUMMARY OF STUDIES CONDUCTED

Time Period	Investigator	Area of Environmental Concern	Purpose of Investigation	Findings
2000-2001	Giroux & Associates	Methane Hazards	Initial methane migration investigation conducted at Cluster 3 and Cluster 12	No clear methane risks identified. However, the study concluded that the results could not be considered representative of all lots.
2001	Giroux & Associates	Air Quality; Odors	To characterize the background levels of hydrogen sulfide (as source of odor) in the study area. Daily samples taken over five days.	Minimal indication of odors except near storm drains.
2000-2001	URS	Air Quality at PDR	Characterization of baseline air quality for methane, and THC.	Concentrations were low in general and within expected ranges for Los Angeles
2001	URS	Air Toxics	Monitored BTEX	Monitoring was performed during SCG PDR venting activities and no correlation was observed in the data.
2003	Methane Specialists and Sullivan Consulting	Methane; Odors	Surface sweep of all lots to determine if any methane was observed at ground level.	Concentrations were either non-detects or very low readings. No odors were detected.
2003-2004	Brown and Caldwell	Health hazards	Make detailed measurements of soil contamination and soil gas on all lots as well as groundwater at Cluster 12. Provide data for the health risk assessment. Repeat measurements over eight months to confirm results.	Sampling confirmed generally low levels of contaminates in most cluster soils. A health risk assessment utilizing these data shows no significant human health risk exists at the clusters.
2003-2004	Methane Specialists	Methane hazards	Working in concert with Brown and Caldwell, make subsurface methane measurements on the lots to determine if any existing methane hazards exist. If methane was measured, to determine the source of methane.	Methane was routinely detected at Cluster 11 below ground level. The source of this methane was attributed to be from decomposition of contaminated soils from historical oil exploration; not from SCG storage gas.
2004	Brown and Caldwell	Health hazards	Determine whether the “fifty-foot gravel layer” at Cluster 12 is presence or not.	Layer not found but clay layer identified at 55 feet would minimize vertical migration methane in the area.
2004	Gary Boettcher Consulting	Odors	Determine the levels in PDR of hydrogen sulfide odors over an extended time period.	While some interesting trends were observed in the data, the values are consistent with typical values for Los Angeles and do not appear to be correlated to SCG activities.

1.4 RANGE OF ALTERNATIVES

CEQA Guidelines 15126.6(a) requires that a range of reasonable alternatives to the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any significant effects of the project, be discussed in an EIR. This EIR identifies and analyzes such a range of alternatives; discusses the environmental effects of each alternative; compares the environmental effects of each alternative with existing conditions and with impacts of the proposed project; and addresses the relationship of each alternative to the project objectives. The determinations of the CPUC concerning the feasibility, acceptance, or rejection of the alternatives considered in this EIR will be addressed and resolved in the CPUC's findings, as required by CEQA. The alternatives consist of the following:

- Alternative 1: No Project
- Alternative 2: Partial Sale – Exclude Cluster 9
- Alternative 3: Partial Sale – Exclude Cluster 12

For a discussion of the components, basis for selection, and impacts of these alternatives see Chapter 5, *Alternatives*.

1.5 USE OF THIS EIR

The CPUC has directed the preparation of this EIR, in conjunction with other information to be developed in the CPUC's formal record, to act on SCG's application under Public Utilities Code Section 851 to sell surplus property in PDR and MDR. In accordance with CEQA requirements, the CPUC will determine the adequacy of the Final EIR and, if adequate, will certify the document. The CPUC has assigned Administrative Law Judge Carol Brown to oversee the proceeding and Commissioner Carl Wood as the Assigned Commissioner for the Section 851 application.

This EIR provides environmental information and evaluation which other state and responsible agencies may rely on to make informed decisions over issuance of specific permits related to the potential future development on the 36 lots proposed for sale. For example, any future construction or active uses of the lots that would occur after the proposed sale would require approval from the City of Los Angeles. In addition to city building applications, permits and approvals may be necessary from the following agencies:

- Division of Oil, Gas & Geothermal Resources (DOGGR)
- South Coast Air Quality Management District (SCAQMD)
- City of Los Angeles
- County of Los Angeles
- California Occupational Health and Safety Administration (Cal/OSHA)
- Regional Water Quality Control Board (RWQCB)

Furthermore, this EIR also provides environmental information upon which to base consideration of each of the alternatives to the project identified above.

1.6 PUBLIC PARTICIPATION

CEQA and the CPUC encourage public participation in the planning and environmental review processes. A Notice of Preparation (NOP) and Initial Study for the project was released for public review on September 3, 2003. The CPUC received six comment letters which are included in Appendix A of this EIR.

In addition, opportunities will be provided for the public to present comments and concerns regarding the project and the adequacy of the Draft EIR during a public review and comment period and at public hearings or meetings before the CPUC. Written public comments may be submitted to the CPUC at any time during the public review and comment period, June 4, 2004 through July 19, 2004. Comments on this EIR can be submitted in writing to:

Mr. Michael Rosauer
CPUC Environmental Project Manager
c/o Environmental Science Associates
225 Bush Street, Suite 1700
San Francisco, CA 94104-4207

Comments can also be submitted via electronic mail at playadivest@esassoc.com. To comment verbally, please leave a voice message at (415) 962-8447. In addition, a website for this project has been set up and can be viewed online at http://www.playadivest.com.

1.7 ORGANIZATION OF THIS DRAFT EIR

The Draft EIR is organized as follows:

Executive Summary: Summarizes the changes that would occur as a result of the proposed project, the reasonably foreseeable associated environmental impacts of specific future development of these lots resulting from the sale, the mitigation measures suggested to reduce or eliminate any identified impacts resulting from the sale as well as specific future development, and alternatives to the project.

Chapter 1, Introduction: Provides an introduction and overview that describes the proposed sale and the purpose of the Draft EIR, summarizes the Draft EIR review and certification process, and identifies the environmental issues.

Chapter 2, Summary of Environmental Impacts: Describes the proposed project, the controversial issues associated with the project, the environmental effects of the project, and alternatives to the project (including the No Project Alternative). Chapter 2 includes Table 2-1, Summary of Environmental Impacts and Mitigation Measures, which identifies each environmental impact, corresponding recommended mitigation measure(s), and the residual level of significance that would occur if those mitigation measures were implemented.

Chapter 3, Project Description: Provides a description of the project sites and their location, the project goals and objectives, the project setting, the project components, and an outline of the approval process.

Chapter 4, Environmental Setting, Impacts, and Mitigation Measures: Describes the existing setting, discusses the environmental impacts of the project, and identifies mitigation measures for the environmental impacts examined in this Draft EIR. The issue areas addressed in the EIR are air quality, biological resources, cultural resources, geology and soils, public health, public safety, hydrology and water quality, noise, transportation and traffic, and utilities and service systems.

Chapter 5, Alternatives Analysis: Presents an analysis of a reasonable range of alternatives to the proposed project, presents the environmental impacts associated with each alternative, and compares the relative impacts of each alternative to those of the proposed project.

Chapter 6, Other CEQA Considerations: Presents discussions of growth inducing effects, cumulative impacts, and unavoidable significant impacts.

Chapter 7, Report Preparation and Public Participation: Lists report preparers and identifies persons and organizations consulted during report preparation.

Chapter 8, Glossary and Acronyms: Defines terms and acronyms used in this Draft EIR.

CHAPTER 2

SUMMARY

2.1 PROJECT OVERVIEW

SCG has submitted its application to the CPUC to sell surplus land associated with 36 lots in PDR and MDR with an approximate total acreage of 4.7 acres. The 34 undeveloped lots located in PDR are grouped into eleven lot clusters; each cluster contains one to eight lots. The two MDR lots represent a single cluster and are located approximately two miles north of PDR. SCG proposes to sell the lots "as-is" without any requirements for future development on the lots; however, all subsurface and mineral rights would not be included in the sale and would be retained by SCG. Twelve of the 36 lots contain an abandoned gas well which were once used by SCG as observation or monitoring wells for the PDR Gas Storage Facility. Per A.99-05-029, between 1998 and 1999 SCG conducted an open process sealed bid sale of these undeveloped lots and has selected four different, already-approved buyers. Sales agreements presented in A.99-05-029 anticipate that one buyer would purchase a single lot (Cluster 5), while the other three would acquire blocks of the remaining 35 lots.

2.2 AREAS OF KNOWN CONTROVERSY

CEQA Guidelines 15123 requires the EIR summary to include "[a]reas of known controversy known to the lead agency including issues raised by agencies and the public." Known areas of controversy, which include issues raised during the public scoping process include:

- Potential for well leaks to occur and the associated health hazards that could result from these leaks
- Impacts to public health that could occur as a result of specific future development of these lots resulting from the sale
- Potential odor impacts that could occur as a result of specific future development of these lots resulting from the sale

2.3 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Table 2-1 presents the summary impact statements, mitigation measures, and residual levels of impact after recommended mitigation described in Chapter 4, "*Environmental Setting, Impact and Mitigation*." For each significant impact, the table includes a summary of recommended mitigation measure(s) and an indication of whether the impact would be mitigated to a less-than-significant level after implementation of recommended mitigation. Please refer to Chapter 4,

"*Environmental Setting, Impacts, and Mitigation Measures*," for a complete discussion of each impact and associated mitigation.

As is stated in the EIR, the transfer of property ownership of the 36 Playa del Rey and Marina del Rey lots from SCG to new owners, would not directly result in any significant environmental impacts. The proposed sale was also evaluated for the necessity to require SCG to provide complete disclosure of existing site conditions and/or other related documents to the four future buyers of the lots as mitigation measures associated with the sale and required in this EIR. Future buyers have already been provided with a substantial amount of information on the lots by SCG. This information will be further supplemented by this environmental review document as well as documents from the supporting field investigation data. Therefore, because the information provided by SCG and by this document are believed to comprise full disclosure of existing site conditions including environmental documentation and supporting scientific information, no mitigation measures are required for the proposed sale.

Although the proposed sale would result in little or no environmental impacts, the reasonably foreseeable associated impacts of development of urban land uses consistent with existing zoning and adjacent land uses resulting from the sale of these lots could result in significant adverse environmental impacts to air quality, biological resources, cultural resources, geology and soils, public health, public safety, hydrology and water quality, noise, transportation and traffic, and utilities and service systems. Recommended mitigation measures identified by this EIR would avoid or reduce all environmental impacts to a less-than-significant level.

2.4 ALTERNATIVES

CEQA requires that a reasonable range of project alternatives be discussed in an EIR. This EIR identifies and analyzes such a reasonable range of alternatives; discusses the environmental effects of each alternative; compares the environmental effects of each alternative with the environmental setting, with the effects of each other alternative, and with the project; and addresses the relationship of each alternative to the project objectives (see Chapter 5, *Alternatives*). The determinations of the CPUC concerning the feasibility, acceptance, or rejection of each and all alternatives considered in this EIR will be addressed and resolved in the CPUC's findings, as required by CEQA. The alternatives consist of the following:

- Alternative 1: No Project
- Alternative 2: Partial Sale – Exclude Cluster 9
- Alternative 3: Partial Sale – Exclude Cluster 12

TABLE 2-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES FOR FUTURE DEVELOPMENT

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
B. <u>Air Quality</u>		
B.1: Construction activities from future development of the 36 lots proposed for sale could increase local pollutant concentrations of particulate matter (from fugitive dust) and carbon monoxide.	**B.1:** During future construction on the 36 lots, the future developer shall reduce PM-10 emissions from the various fugitive dust sources associated with future construction, and maintain the necessary documentation that demonstrates compliance with SCAQMD Rule 403. • Cover all trucks hauling soil, sand, and other loose materials, or require all trucks to maintain at least two feet of freeboard. • Pave, water (three times daily), or apply non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites. • Sweep all paved access roads, parking areas, and staging areas at construction sites daily with water sweepers. • Sweep streets daily with water sweepers if visible soil material is carried onto adjacent public streets. • Hydroseed or apply non-toxic stabilizers to inactive construction areas. • Enclose, cover, water (twice daily), or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 miles per hour.	Less than significant

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	• Install sandbags or other erosion control measures to prevent silt runoff to public roadways during rainy season construction (November through April). • Replant vegetation in disturbed areas as quickly as possible. • All construction equipment shall be properly tuned and maintained. • General contractors shall maintain and operate construction equipment so as to minimize exhaust emissions. During construction, trucks and vehicles in loading or unloading queues shall be kept with their engines off, when not in use, to reduce vehicle emissions. • Construction activities shall be staged and scheduled to avoid emissions peaks, and discontinued during second-stage smog alerts.	
B.2: Operational emissions associated with future development of the 36 lots proposed for sale could introduce additional emissions into the area that could conflict with applicable regional air quality plans.	None required	Less than significant
B.3: Future development of the lots proposed for sale could expose sensitive receptors to hazardous pollutants from potentially leaking wells or existing contamination of the lots.	None required	Less than significant

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
B.4: Future development of the 36 lots proposed for sale could create objectionable odors affecting a substantial number of people or expose future residents to objectionable odors from the lots.	None required	Less than significant
B.5: Future development of the 36 lots proposed for sale, when combined with other local projects, could result in a cumulative air quality impact.	None required	Less than significant
C. <u>Biological Resources</u>		
C.1: Future development at most PDR lots could result in harassment or mortality of species-status avian species.	**C.1:** If construction activities, including tree removal, occur during the avian nesting season (March 1–August 15), surveys for raptors and other native nesting birds protected under the Migratory Bird Treaty Act and Sections 3503, 3503.5, 3511, and 3800 of the California Fish and Game Code shall be conducted by a qualified biologist immediately prior to construction within 500 feet of the construction site (or a distance determined by the surveying biologist). If no adults or nests are observed within the construction area or within 500 feet of the project lots, then no further mitigation is required. If nests or paired adults are observed, one of the following two options shall be completed to reduce impacts on these species: (1) avoid the nesting area and related habitat by remaining at least 500 feet from raptor nests (other nesting birds require 250-foot buffer zone), or as determined by the surveying biologist (this distance may be modified in consultation with CDFG, depending upon site circumstances); or (2) avoid tree removal activities or construction until after the nesting season (August 15) or until after the young have fledged.	Less than significant

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
C.2: Future development at PDR Cluster 9 could result in harassment or mortality of monarch butterfly, a CDFG special-concern species and a rare species under CEQA.	**C.2:** If construction activities, including tree removal occur during the monarch butterfly temporary aggregation season (September–December), presence/absence for overwintering monarch butterfly roosts shall be conducted by a qualified biologist immediately prior to construction. If no roosts are observed within the construction area of the project lots, then no further mitigation is required. If roosts are observed, then avoid tree removal activities (or construction activities if trees remain on site) shall be avoided until after the temporary aggregation season (September–December) or until monarch butterfly have moved from the site.	Less than significant
C.3: Future development at MDR Cluster 12 could result in harassment or mortality of globose dune beetle, a federal species of concern and a rare species under CEQA.	**C.3:** Focused surveys for globose dune beetle shall be conducted by a qualified biologist during the appropriate identification season prior to construction at MDR Cluster 12. If no globose dune beetles are observed at MDR Cluster 12, then no further action would be required. If globose dune beetles are observed, the owner shall compensate for impacts to the beetle, assuming that the sale of the property would result in residential development and loss of habitat. Compensation shall be at a ratio of 1.5:1 (i.e., area compensated to area impacted) and could include: (1) contributing in-lieu funds to ongoing or new coastal dune scrub projects that promote establishment of globose dune beetle on lands preserved in perpetuity within Los Angeles County; or (2) enhancing or restoring coastal dune scrub habitat in perpetuity to promote establishment of globose dune beetle within suitable areas in Los Angeles County, which would include five-year annual restoration monitoring to determine the success of the restoration site. Performance standards for habitat restoration could include: (a) plantings, as a whole, exhibit at least 70 percent	Less than significant

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	cumulative survival and have attained 75 percent cover at the restoration site at the end of the five-year monitoring period; or (b) no invasive non-native plant species within the restoration site.	
D. <u>Cultural Resources</u>		
D.1: Future development of the lots could cause substantial adverse changes to the significance of currently unknown cultural resources.	**D.1:** Pursuant to CEQA Guidelines 15064.5 (f), provisions for historical or unique archaeological resources accidentally discovered during construction shall be instituted. In the event that prehistoric or historic subsurface cultural resources are discovered during ground-disturbing activities, all work within 50 feet of the resources shall be halted and the City shall consult with a qualified archaeologist or paleontologist to assess the significance of the find. If any find is determined to be significant, representatives of the City and the qualified archaeologist and/or paleontologist shall meet to determine the appropriate avoidance measures or other appropriate mitigation. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards. If the discovery includes human remains, CEQA Guidelines 15064.5 (e)(1) shall be followed, which includes: (e) In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps shall be taken:	Less than significant

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	(1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: (A) The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required, and (B) If the coroner determines the remains to be Native American: 1. The coroner shall contact the Native American Heritage Commission within 24 hours. 2. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. 3. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or	

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	(2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance. (A) The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission. (B) The descendant identified fails to make a recommendation; or (C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.	

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
D.2: Future development could damage or degrade unidentified paleontological remains.	**D.2:** The project proponent shall notify a qualified paleontologist of unanticipated discoveries and subsequently document the discovery as needed. In the event of an unanticipated discovery of a breas, true, and/or trace fossil during construction, excavations within 100 feet of the find shall be temporarily halted or diverted until the discovery is examined by a qualified paleontologist. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find.	Less than significant
E. <u>Geology and Soils</u>		
E.1: If commercial or residential development occurs on the project lots and a major earthquake occurs in the region, seismic ground shaking could potentially injure people residing or visiting the project lots and could cause collapse or damage to structures if placed on the lots. An earthquake could cause damage to abandoned or unknown well casings.	**E.1:** A site-specific, design level geotechnical investigation for each building (which is typical for any large development project) shall be required as part of this project. Each investigation shall include an analysis of expected ground motions at the site. The analyses shall be in accordance with applicable City ordinances and policies and consistent with the 1997 UBC (or any more recent version of the UBC adopted by the City of Los Angeles), which requires structural design that incorporates ground accelerations expected from known active faults. In addition, the investigations will determine final design parameters for the walls, foundations, and foundation slabs. The investigations shall be reviewed by a registered geotechnical engineer. All recommendations by the project engineer and geotechnical engineer shall be included in the final design. Recommendations that are applicable to foundation design, earthwork, and site preparation that were prepared prior to or during the project design phase shall be incorporated into the project. The final seismic considerations for the site shall be submitted to and approved by the City of Los Angeles	Less than significant

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	Department of Public Works.	
E.2: In the event of a major earthquake in the Los Angeles region, the 36 lots proposed for sale would be subjected to seismic ground shaking and depending on the site-specific geologic conditions and level of ground motion, may be subjected to earthquake-induced, secondary ground failures including liquefaction, earthquake-induced landslides, and earthquake-induced settlement.	**E.2:** A site-specific, design level geotechnical investigation shall be required for all lots prior to development, especially those lots that may be susceptible to secondary seismic ground failure. The investigation shall consider the proposed development designs and provide engineering recommendations for mitigation of liquefiable soils and seismically-induced ground failure resulting in landslides or soil collapse. These recommendations shall become part of the future project. Where applicable, prior to incorporation into the project, geotechnical engineering recommendations from previous investigations regarding the mitigation and reduction of liquefaction, landslides, and ground failure for each site shall be reviewed for compliance with California Geological Survey's (CGS) *Geology Guidelines for Evaluating and Mitigating Seismic Hazards (CGS Special Publication 117, 1997).*	Less than significant
E.3: If eventually developed for commercial or residential uses, some of the 36 project lots that are proposed for sale may be subject to geologic hazards attributable to expansive or settled soils and erosion. These hazards could cause risks to life and property.	**E.3:** A site-specific, design level geotechnical investigation shall be required for all of the lots proposed for sale to determine the presence or absence of expansive soils or those soils that could not accommodate building loads. Such geotechnical investigations and reports shall include generally accepted and appropriate engineering techniques. Engineering recommendations shall become part of the future project. In addition, future developers shall adhere to local grading and construction policies to reduce the potential for geologic hazards, including differential settlement and soil erosion. All construction activities and design criteria shall comply with applicable codes and requirements of the California Building Codes and applicable local construction and grading ordinances.	Less than significant

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
E.4: Future development of the 36 project lots, when combined with other foreseeable development in the vicinity, could result in cumulative impacts with respect to geology.	None required	Less than significant
F. <u>Public Health</u>		
F.1: Development and occupation of the lots proposed for sale could result in impacts to public health.	None required. Los Angeles City Building Code requires additional mitigation for methane and other gases be implemented when construction occurs at these sites. These additional measures include the installation of membrane barriers and vent piping as well as trench dams and electrical seal offs for each of these properties. Since these measures are already required by regulation, they are not mitigation measures according to CEQA, and the public health impacts at these clusters would be less than significant.	Less than significant
F.2: Future development and related construction activities could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	None required	Less than significant
F.3: Public exposure to toxic chemicals from the future development of the 36 lots proposed for sale and other projects or cumulative development could result in an increase in health risks in the project area. Under that condition, the proposed sale's increases in health risks, in combination with other cumulative projects, would be less than significant.	None required	Less than significant

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
G. Public Safety		
G.1: Future construction and occupation of the lots proposed for sale could result in an explosion or in exposure to acutely hazardous substances.	None required	Less than significant
G.2: Future development of the 36 lots proposed for sale could result in the release of acutely hazardous substances resulting in unsafe levels at nearby schools.	None required	Less than significant
G.3: Future development of the 36 lots proposed for sale could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	None required	Less than significant
G.4: Cumulative development projects in the area, along with the future development of the 36 lots proposed for sale could result in the storage or release of flammable or acutely hazardous substances that could impact the public.	None required	Less than significant
H. Hydrology and Water Quality		
H.1: Future development of the 36 lots proposed for sale could result is surface water degradation resulting in the introduction of additional pollutants to receiving water and violations to water quality standards or waste discharge requirements.	None required because implementation of Los Angels RWQCB SUSWMP would be expected to fully mitigate potential impacts from future development on the lots proposed for sale.	Less than significant
H.2: Future development of the 36 lots proposed for sale would increase impervious surfaces and reduce, over pre-project conditions, groundwater infiltration volumes and rates leading to a local reduction in groundwater recharge.	None required	Less than significant

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
H.3: Future development of the 36 lots proposed for sale would create additional runoff that would contribute to existing runoff volumes and exceed the capacity of existing or planned stormwater drainage systems resulting in onsite flooding and downstream flooding.	**H.3:** Prior to obtaining a building permit, future developers shall prepare a drainage plan for each site and submit it with the building permit application, as required by the City of Los Angeles Public Works Department.	Less than significant
H.4: Future development of the 36 lots proposed for sale could place residences and commercial buildings within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.	None required	Less than significant
H.5: Future development of the 36 lots proposed for sale would expose people or structures to a significant risk of loss, injury or death involving inundation of tsunami.	None required	Less than significant
H.6: Future development of the 36 lots proposed for sale would increase site impervious surfaces and, therefore, add to the amount of runoff.	None required	Less than significant
I. <u>Noise</u>		
I.1: Future development on the lots could expose people to or generate noise levels in excess of standards established in the Los Angeles General Plan and Los Angeles Municipal Code.	**I.1a:** Limit construction activities to between 7:00 a.m. and 7:00 p.m. Monday through Friday. On weekends, construction would be limited to the hours between 8:00 a.m. to 6:00 p.m. in accordance with the City of Los Angeles Noise ordinance. **I.1b:** To reduce daytime noise impacts due to construction, construction contractors shall implement the following measures:	Less than significant

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	• Equipment and trucks used for project construction shall utilize the best available noise control techniques (*e.g.*, improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds); • Impact tools (*e.g.*, jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used where feasible, and this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment; • Stationary noise sources shall be located away from sensitive receptors, and they shall be muffled and enclosed within temporary sheds or incorporate insulation barriers; • Signs shall be posted at the construction site that include permitted construction days and hours, a day and evening contact number for the job site, and a day and evening contact number for the City in the event of problems; • An onsite complaint and enforcement manager shall be posted to respond to and track complaints. The manager should be responsible for responding to any complaints regarding construction noise and for	

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
	coordinating with the adjacent land uses. The manager should determine the cause of any complaints and coordinate with the construction team to implement measures warranted to correct the problem. The telephone number of the coordinator shall be posted at the construction site and provided to neighbors in a notification letter. The manager shall be trained to use a sound level meter and shall be available during all construction hours to respond to complaints; and • A preconstruction meeting shall be held with the job inspectors and the general contractor/on-site project manager to confirm that noise mitigation and practices are completed prior to the issuance of a building permit (including construction hours, neighborhood notification, posted signs, etc.).	
I.2: Future development of the lots could result in long-term traffic increases and could cumulatively increase noise levels.	None required.	Less than significant
J. <u>Transportation and Traffic</u>		
J.1: Future development would add vehicle trips to local roadways.	**J.1:** A trip generation study shall be performed by the developer of the commercial property located in Cluster 5, in adherence with the City of Los Angeles Department of Transportation criteria.	Less than significant
J.2: Future development project construction would result in temporary increases in truck traffic and construction worker traffic.	**J.2:** Construction contractors shall implement measures such as limiting the transport of construction materials and equipment to off-peak traffic periods, as required by the City of Los Angeles.	Less than significant

TABLE 2-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
J.3: Future development could increase interaction between motorists, bicyclists, and pedestrians.	None required	Less than significant
J.4: Future development could result in inadequate emergency access for the 36 lots proposed for sale.	None required	Less than significant
J.5: Future development would generate the need for onsite parking.	**J.5:** The developer of the commercial property shall provide adequate onsite parking, in accordance with the City of Los Angeles Municipal Code requirements. *)*	Less than significant
J.6: In combination with other development projects in the area, future development would add vehicle trips to local roadways.	**J.6:** Implement Mitigation Measure J.1.	Less than significant
K. <u>Utilities and Service Systems</u>		
K.1: Future development would require additional domestic water service from LADWP.	None required	Less than significant
K.2: Future development would decrease the excess wastewater capacity of the Los Angeles Department of Public Works, Bureau of Sanitation.	None required	Less than significant
K.3: Future development would generate solid waste.	None required	Less than significant
K.4: The future development of the 36 lots proposed for sale would cumulatively, with other cumulative projects in the area (as described in Section 3.6), increase demand for water from LADWP, decrease the excess capacity of the Hyperion Treatment Plant, and increase the generation of solid waste.	None required	Less than significant

CHAPTER 3

PROJECT DESCRIPTION

Southern California Gas Company (SCG), in its California Public Utilities Commission (CPUC) application (A.99-05-029), proposes to value and sell surplus SCG property in Playa del Rey (PDR) and Marina del Rey (MDR), California.

3.1 PROJECT LOCATION

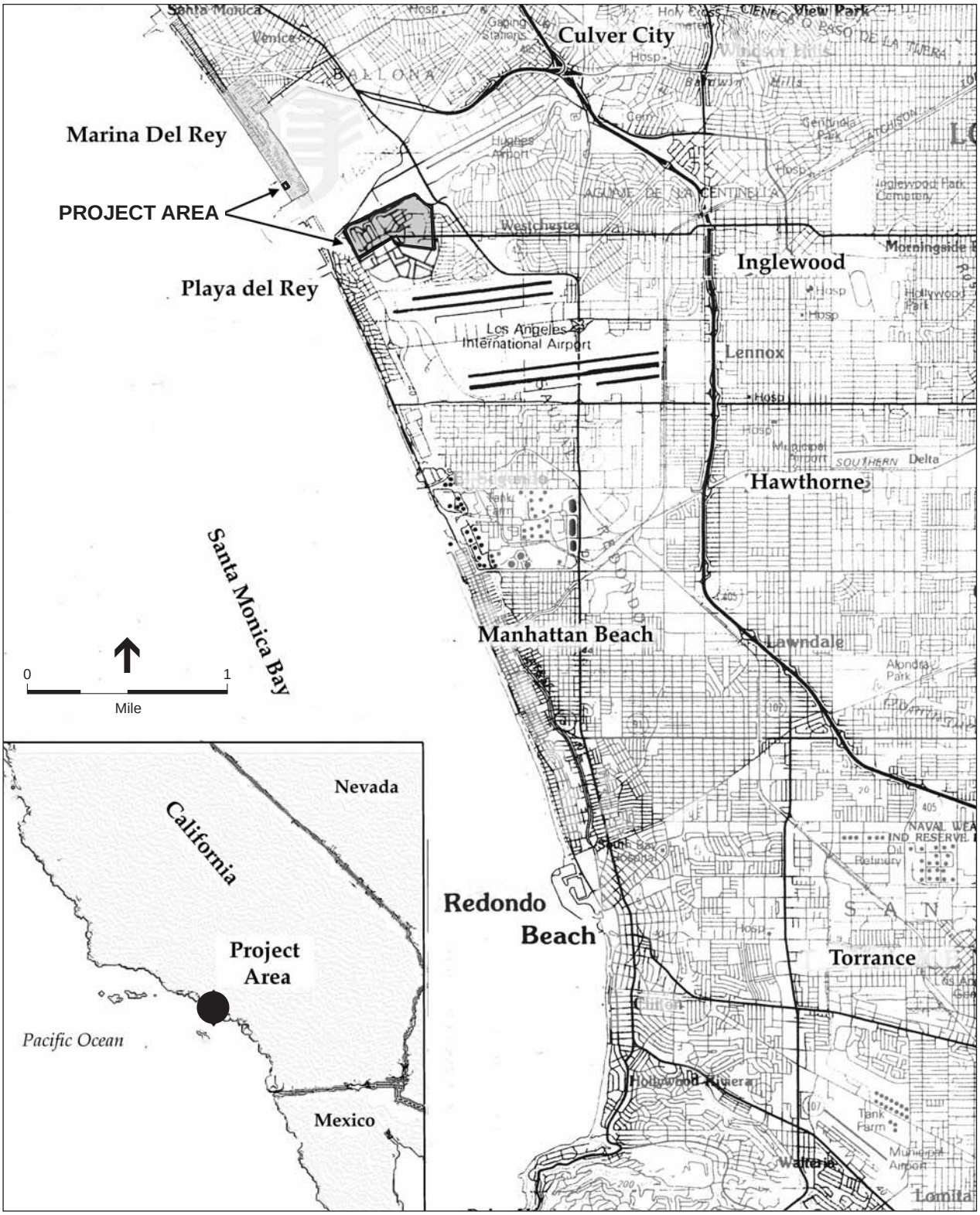
The project area is approximately four miles south of the city of Santa Monica, 1.5 miles north of the Los Angeles International Airport (LAX), and five miles west of Culver City, and is bordered by Santa Monica Bay to the west. PDR is located within the city of Los Angeles, and MDR is located within the county of Los Angeles. MDR is approximately two miles northwest of PDR, separated by the Ballona Wetlands and the MDR Channel. A general project location is shown on **Figure 3-1**, and an aerial photograph of the properties and surrounding area is presented in **Figure 3-2**.

3.2 PROJECT COMPONENTS

There are 34 undeveloped lots in PDR proposed for sale; these lots are grouped into eleven lot clusters that consist of one to eight lots each (see **Table 3-1**). The two MDR lots represent a single cluster and are located approximately two miles north of PDR. The combined acreage of all 36 lots is approximately 4.7 acres. Twelve of the lots contain an abandoned gas well that were once used by SCG as observation or monitoring wells for the PDR Gas Storage Facility. Cluster 1 contains a single well located on a single lot while cluster 8 is comprised of eight lots, each containing one well. SCG has maintained ownership of these lots and associated wells, which were used as oil production wells and/or converted for gas storage operations. In order to operate and maintain the wells, sufficient land around each well was required to support the transport and operation of heavy equipment employed to service the wells.

Per A.99-05-029, between 1998 and 1999 SCG conducted an open process sealed bid sale of these undeveloped lots and has selected four different, already-approved buyers. Sales agreements presented in A.99-05-029 anticipate that one buyer would purchase a single lot (Cluster 5), while the other three would acquire blocks of the remaining 35 lots.

See **Figures 3-3** and **3-4** for the mapped locations of the PDR and MDR lots.



SOURCE: Environmental Science Associates

Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey Project / 202639

Figure 3-1
Project Vicinity Map

SOURCE: Environmental Science Associates

Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey Project / 202639

Figure 3-2
Aerial Map of Project Area

TABLE 3-1
PROJECT LOTS AND ASSOCIATED ABANDONED WELLS

Cluster No. / Location	No. of Lots	Well Designation	Date Abandoned
Playa del Rey			
1) Corner of 81st/Berger Place	1	Anglo American Champ No. 1	July 1958
2) North side of 82nd Avenue	2	Joyce 1	March 15, 1993
3) Corner of 83rd and Saran Drive	3	Lor Mar 1	December 1, 1992
4) 85th Street	2	O and M 1	April 1956
5) Saran Drive	1	Hisey 1	November 9, 1992
6) Manchester Avenue	3	Merrill 1	September 24, 1992
7) 83rd Avenue, middle of 81st - 82nd	5	13-1	October 2, 1992
8) 79th and 83rd	8	23-1	July 14, 1993
9) 83rd Avenue (Western 83rd)	4	Samarkand 1	December 8, 1992
10) Falmouth / Calabar Avenue	3	29-2	July 26, 1994
11) Falmouth / Calabar Avenue	2	29-1	August 4, 1994
Marina del Rey			
12) Union Jack / Speedway	2	Troxel 1	March 15, 1994

SOURCE: Brown and Caldwell, 2002

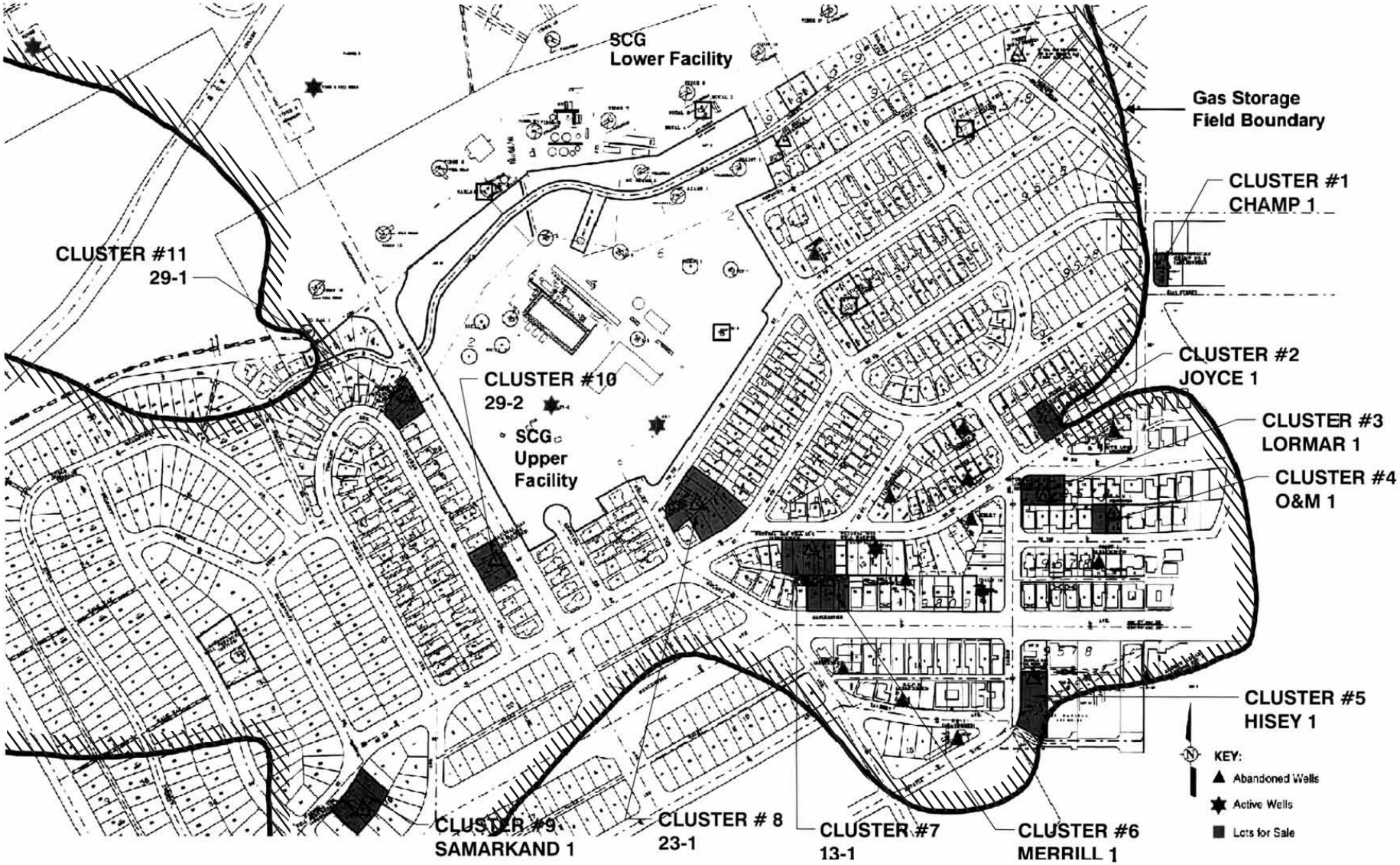
DESCRIPTION OF CLUSTERS/LOTS

Cluster 1 – Lot 6 on the Corner of 81st Street and Berger Place (Figure 3-5)

This lot is located at the northeast corner of 81st Street and Berger Place. Single-family homes border this lot on the north and east and are located across 81st Street and Berger Place. This lot is level, covered with grass, and has an approximate 4-foot brick divider wall on two sides.

Cluster 2 – Lots 3 and 4 on 82nd Street (Figure 3-6)

This group of adjoining lots is located along the north side of 82nd Street. The lots are surrounded by single-family homes and are unfenced. These lots are mostly level and contains vegetation, including trees and grass.

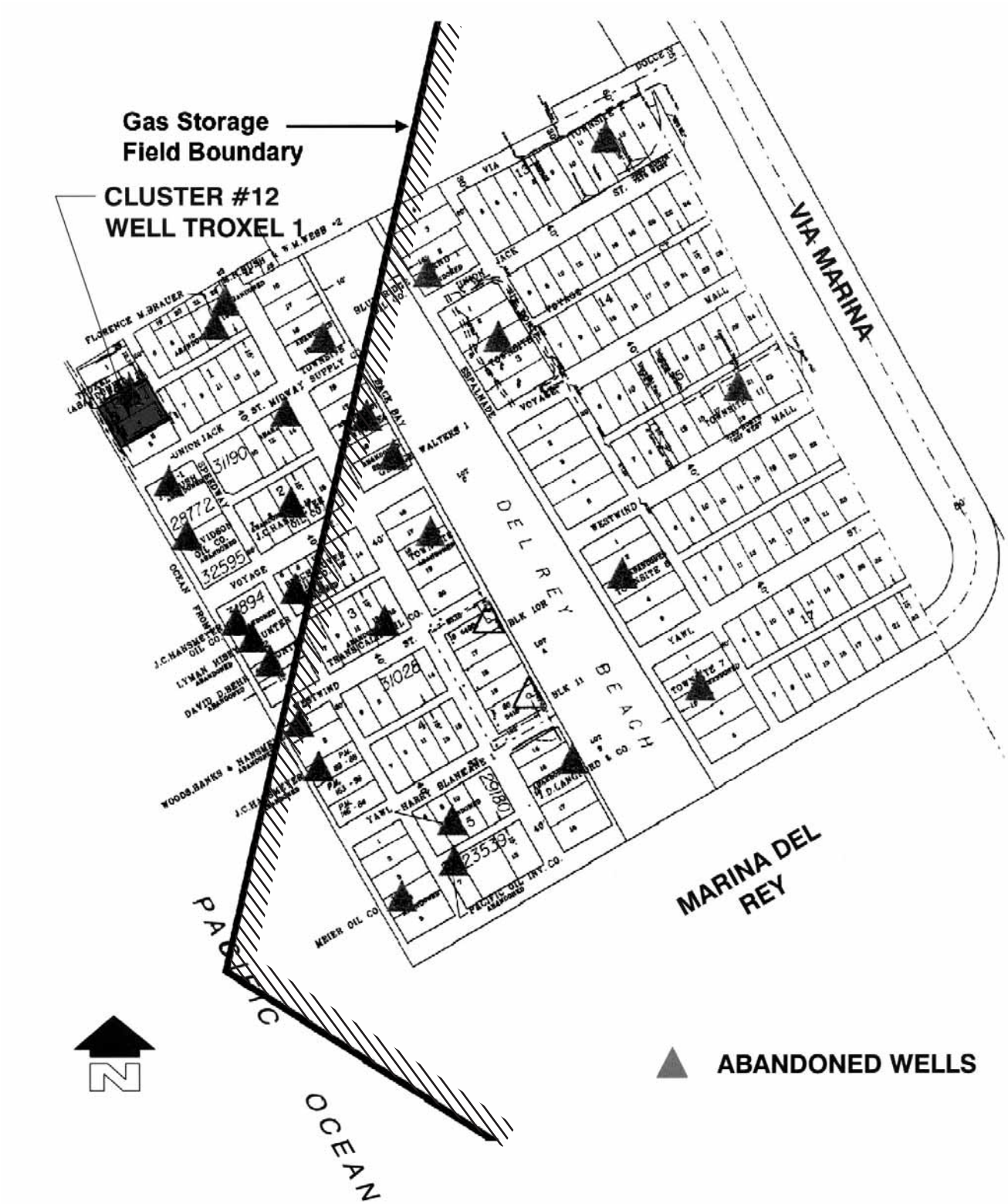


SOURCES: Environmental Science Associates, Southern California Gas Company

Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey Project / 202639

Figure 3-3

Annotated Site Map - Playa del Rey



SOURCES: Environmental Science Associates, Southern California Gas Company

Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey Project / 202639

Figure 3-4

Annotated Site Map - Marina del Rey

Cluster 3 – Lots 14–16 on 83rd Street (Figure 3-7)

This group of adjoining lots is located at the corner of 83rd Street and Saran Drive. These lots are surrounded by single-family homes. A wooden fence with a brick base borders one edge of the cluster. These sites are level and contain vegetation, including mature trees and grass.

Cluster 4 – Lots 6 and 7 on 85th Street (Figure 3-8)

This group of adjoining lots is located along 85th Street and is surrounded by single-family homes. These sites are mostly level, with mature vegetation trees, shrubs, and grass. The site is unfenced.

Cluster 5 – Lot 11 on Saran Drive (Figure 3-9)

This single lot is located along Saran Drive, south of Manchester Avenue. The lot is bordered on the west by Saran Drive and on the east and north by commercial shops and offices. An apartment complex is located across an alley, to the south of the lot. This lot is unfenced and contains mature trees, shrubs, and grass. Dirt trails and utility poles traverse the site.

Clusters 6 and 7 – Lots 14–18 on 83rd Street (Figure 3-10) and Lots 28–30 on Manchester Avenue (Figure 3-11)

This group of adjoining lots is bordered on the north by 83rd Street and on the south by Manchester Avenue. Single-family and apartment homes border these sites on the east and west. The lots are unfenced and mounds of dirt are located throughout the site. The lots contain mature trees, shrubs, and grass. Dirt trails traverse this cluster.

Cluster 8 – Lots 17–20 on 79th Street and Lots 82–85 on 83rd Street (Figure 3-12)

This group of adjoining lots is bordered on the north by 79th Street and on the south by 83rd Street. The lots are bordered by residential development to the east. One home, located at the corner of Gulana Avenue and 83rd Street, is surrounded on two sides by these undeveloped lots. These lots are unfenced and contain mature trees, shrubs, and grass. Dirt trails traverse this cluster.

Cluster 9 – Lots 5–8 on 83rd Street (Figure 3-13)

These adjoining lots are surrounded by single-family residential development. These lots are accessed from the northern edge along 83rd Street. Adjacent to the lots, on the south, are several small apartment complexes. These lots are not fenced and feature mature trees and a small grassy area with a bench.

Cluster 10 – Lots 5–7 on Calabar Avenue (Figure 3-14)

These lots are bordered on the north and south by single-family homes, on the west by Calabar Avenue, and on the east by Falmouth Avenue. Steep slopes on Calabar Avenue, approximately 25 feet higher than elevations on Falmouth Avenue, characterize the lots. Surrounding homes

with front entrances on Calabar Avenue and rear yards along Falmouth Avenue are built into the Calabar slope. These lots are not fenced and contain a mix of low-growing vegetation on the slope and some trees and shrubs along the northern and southern boundaries.

Cluster 11 – Lots 18 and 19 on Calabar Avenue (Figure 3-15)

This group of adjoining lots is bordered on the west by Calabar Avenue, on the east by Falmouth Avenue, and on the north and south by single-family detached homes. Steep slopes on Calabar Avenue, approximately 35 feet higher than elevations at Falmouth Avenue, characterize these lots. These lots contain a retaining wall on the north end and are fully fenced. In addition, a mix of low-growing vegetation, with a few trees and shrubs, is present along the northern and southern boundaries of the cluster.

Cluster 12 – Lots on Speedway Avenue in Marina del Rey (Figure 3-16)

These two adjoining lots are located north of Union Jack Street and between Speedway Avenue and Venice Beach on the MDR peninsula between Santa Monica Bay and the channel of MDR. The site is bordered on the north and south by multifamily apartment buildings, on the west by Venice Beach, and on the east by alleyways, lanes, and Speedway Avenue. These lots are fenced and covered with moderately sparse grass and sand.

3.3 PROJECT OWNERSHIP TRANSFER AND CONDITIONS

The sale of the lots would result in what is typically referred to as “clean and clear” of the sites; that is cleanup of each site to a level suitable to the approved buyers. The following discussion clarifies the transfer methods and conditions of the property sale.

CONDITIONS OF OWNERSHIP TRANSFER

Per SCG’s sale agreement, the lots are to be sold “as is” with subsurface and mineral rights being retained by SCG. Per California Public Resources Code Section 3251.5, SCG would be obligated to mitigate any well-related adverse effects on future beneficial uses of the surface rights associated with these lots for 15 years from the date of well abandonment (see Table 3-1 for dates of well abandonment). For example, SCG would be responsible for repairing a leaking abandoned well if the SCG storage field activities caused the leak.

LIABILITY

A thorough environmental investigation has been performed by SCG. Per A.99-05-029, the approved buyers have been provided with documentation from an independent environmental consultant employed by SCG detailing the conditions found and any remaining cleanup to be completed. The approved buyers have also been provided with adequate time to complete their own investigation, should they desire to do so. The buyers have the right to terminate the purchase agreement if site conditions differ from those represented by SCG. The sales agreements specify that the properties would be sold “as is,” with the new buyers assuming all

liability for cleaning up any remaining contamination from past use of the property. After the sale, the buyers would indemnify SCG and its ratepayers from any future liability for contamination found.

SCG has prequalified prospective buyers to ensure that liability would not revert back to SCG (and thus its ratepayers). SCG would evaluate the buyers to determine whether there is a corporate structure that could cause liability to revert back to SCG and its ratepayers. Among other things, SCG may require the buyers to provide financial assurance (such as environmental insurance, with SCG as the beneficiary) in the event that the new buyers fail to comply with laws and regulations or otherwise default on their obligations under the sales agreement.

ENVIRONMENTAL COMPLIANCE

Compliance with applicable environmental laws, permits, and approvals is a condition of the sale to the new buyers. SCG would be required to disclose any areas of suspected contamination and/or areas with past contamination that have been remediated to the prospective buyers. SCG must also comply with any mitigation measures imposed by the CPUC in this EIR as a condition of property transfer. Furthermore, the developers of the lots must comply with any mitigation measured required during the course of the future development of 36 lots by local, state and federal agencies. This EIR identifies and suggest mitigation measures that the CPUC contemplates these agencies to review and adopt in the course of this specific future development.

3.4 PROJECT OBJECTIVES

SCG has identified three project objectives associated with this sale:

- To remove SCG assets no longer necessary for public utility service – Since SCG has declared these properties as neither “necessary or useful” to its PDR gas storage operations, they are now considered to be surplus properties.

- To return these assets to the public – by accomplishing divestiture of these assets, the properties would be returned to the public for other uses.

- To provide a benefit to ratepayers – After divestiture, ratepayers would no longer be assessed for SCG’s ownership and stewardship of these surplus properties.

3.5 HISTORICAL BACKGROUND

All of the 36 lots proposed for sale overlie the existing SCG PDR Gas Storage Field, as shown on **Figures 3-3** and **3-4**. This gas storage field lies approximately 6,000 feet below ground surface and had an extensive history of exploration and extraction activity during the 20th century. Oil drilling in the PDR / MDR area began as early as 1921. Early holes drilled and abandoned in the area during 1925 and 1926 were not deep enough to reach the oil-producing zones. The discovery well for the PDR / MDR region was completed in 1929. Primary field development

Figure 3-5: Cluster 1 - Lot 6 on the Corner of 81st Street and Berger Place

Figure 3-6: Cluster 2 - Lots 3 and 4 on 82nd Street

Figure 3-7: Cluster 3 - Lots 14 through 16 on 83rd Street

Figure 3-8: Cluster 4 - Lots 6 and 7 on 85th Street

SOURCE: Environmental Science Associates

Figure 3-9: Cluster 5 - Lot 11 on Saran Drive

Figure 3-10: Cluster 6 - Lots 14 through 18 on 83rd Street

Figure 3-11: Cluster 7 - Lots 28 through 30 on Manchester Avenue

Figure 3-12: Cluster 8 - Lots 17 through 20 on 79th Street and Lots 82 through 85 on 83rd Street

SOURCE: Environmental Science Associates

Figure 3-13: Cluster 9 - Lots 5 through 8 on 83rd Street

Figure 3-14: Cluster 10 - Lots 5, 6 through 7 on Calabar Avenue

Figure 3-15: Cluster 11 - Lots 18 and 19 on Calabar Avenue

Figure 3-16: Cluster 12 - Lots on Speedway Avenue in Marina del Rey

SOURCE: Environmental Science Associates

continued through the mid-1930s. By the early 1940s, production had reached its economic limit and operators abandoned oil production from the field. In 1942, as part of the national war effort, the federal government condemned and took possession of approximately 240 acres of the PDR / MDR region to use as a natural gas storage field. This gas storage field was transferred to the Reconstruction Finance Corporation in 1945. Then, in 1953, the Reconstruction Finance Corporation declared the field to be surplus and offered it for sale. SCG was the successful bidder and assumed operations in late 1953[1]. SCG facilities were completed in 1956, at which time gas was injected and stored at depths of about 6,200 feet within the conglomerate trap zone. By July 1958, approximately 28 billion cubic feet of cushion gas had cycled in and out of the PDR Gas Storage Field[2]. Since that time, numerous wells have been used for storage and retrieval of the gas. Currently, the gas storage field is operated through 54 wells directionally drilled from the lowlands and hilltop of PDR. Of these 54 wells, 25 are injection/withdrawal wells used to inject and extract gas, eight are liquid (primarily water) removal wells, three are lateral migration wells to control gas movement, and 18 are observation wells used to monitor pressure and liquid saturation. None of these 54 wells are connected to or associated with the 12 wells that are located on the 36 lots proposed for sale.

The 36 lots proposed for sale and the 12 wells associated with these lots were originally used or could have been used to monitor gases and liquids in the PDR gas storage zone (6,000 feet below ground surface). As shown in **Table 3-1**, all 12 wells have been abandoned[3] and the lots do not support the operations and maintenance of the SCG's PDR Gas Storage Field.

A brief historical description of the abandoned wells found on the 12 lot clusters is provided below:

- **Joyce 1, Samarkand 1, 23-1, 29-1, and 29-2 (PDR)**

  These wells were part of the fluid system that removed underground saltwater that would otherwise fill the porous rock in the storage zone. These wells were abandoned because they did not produce significant amounts of water and the cost to operate them exceeded the benefit.

- **Anglo American Champ No. 1, and O and M 1 (PDR)**

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1 SCG has indicated that although it did not complete the purchase of the field until 1953, SCG actually began operation of the Playa del Rey Storage Field in 1942. Letter to Mr. Roosevelt Grant, former CPUC Environmental Project Manager, CPUC dated October 2, 2003 from Mr. Gregory Healy, Regulatory Case Administrator, Sempra Energy.

2 The total capacity of the Playa del Rey Storage Field in 1958 was 7 billion cubic feet; SCG indicates that the field has about the same capacity today. Letter to Mr. Roosevelt Grant, former CPUC Environmental Project Manager, CPUC dated October 2, 2003 from Mr. Gregory Healy, Regulatory Case Administrator, Sempra Energy.

3 California Division of Oil, Gas & Geothermal Resources (DOGGR) adopted regulations for well abandonment to ensure that well abandonments are done safely and effectively. These regulations are explained in detail in the California Code of Regulations (CCR), Title 14, Chapter 4, and provide procedures for well abandonment that prevent future migration of oil and gas, protection of groundwater quality, and protection of public safety. Specific requirements include plugging of the oil or gas zone with concrete or other acceptable material (judged by the DOGGR district deputy), possible recovery of well casings, and/or production of detailed records of well history, casing history, and plugging operations. After subsurface abandonment has been completed and the surface portions of the well are removed, DOGGR completes a final inspection of the well site to ensure that the well has been properly abandoned.

These wells were drilled in 1935 and abandoned in 1937 and 1936, respectively, because they were not producing oil in economically viable amounts. SCG did not operate these wells. However, SCG re-abandoned these wells in 1958 to meet existing California Division of Oil, Gas & Geothermal Resources (DOGGR) abandonment standards. These wells have never been involved in storage operations.

- **Hisey 1, Lor Mar 1, Merrill 1, and 13-1 (PDR)**

  These wells were located in a smaller, separate reservoir (in the same formation as the main area) that was not providing usable storage capacity. This reservoir became saturated with water in the 1970s and has not been used since then.

- **Troxel 1 (MDR)**

  This well was drilled in 1930 and produced oil from that time till its abandonment in 1993. It was re-abandoned in 1994 after leaking small amounts of native marsh gas. The well was located in a different reservoir and thus was not providing any value in the PDR gas storage field.

3.6 RELEVANT CUMULATIVE PROJECTS

CEQA Guidelines 15130 requires an EIR to discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. CEQA Guidelines 15355 defines a cumulative impact as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Furthermore, CEQA Guidelines 15065(c) defines a cumulatively considerable impact as the incremental effects of an individual project when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probably future projects. To determine the relevant cumulative projects to be considered in this EIR, a survey was performed to determine closely related past, present, and reasonably foreseeable projects in the vicinity of the PDR and MDR project area. These relevant projects are listed below:

- **Village at Playa Vista** – A single-family subdivision in the Westchester–Playa del Rey Community Plan Area. This project is located about one mile north of the PDR lots and is currently under review by the City of Los Angeles. The project consists of the following two components: (1) a mixed-use community, and (2) a 6.7-acre riparian corridor and restoration/maintenance of a portion of the Westchester Bluffs adjacent to the riparian corridor. The project involves urban development on 99.3 acres, and habitat creation/restoration on 11.7 acres.

- **Mountain Gate** – A single-family subdivision in the Westchester–Playa del Rey Community Plan Area located approximately ten miles north of MDR. This project is currently under review by the City of Los Angeles.

- **Westchester Community Plan Update** – Refinement of the existing 1996 General Plan Framework Element to guide development through 2025. The City of Los Angeles identified potential impacts in the following areas: geology, air quality, noise, land use, transportation, public services, utilities, recreation, and population, employment, and

housing. The 36 lots proposed for sale are included within the Community Planning area. This plan update is currently under review by the City of Los Angeles.

- **Palisades Landmark Condominium Project** – Located within the Brentwood - Pacific Palisades Community Plan Area, this project consists of 20 apartment units in two buildings, construction of 25-story townhouses (3,000 square feet), and 57 four-story condos, on approximately four acres of hillside terrain. This project is located approximately nine miles north of the MDR lots and is currently under review by the City of Los Angeles.

- **Brentwood Project "The Park"** – This project consists of approximately 54,700 square feet of commercial uses in the Brentwood–Pacific Palisades Community Plan Area. This project, located about seven miles north of MDR, has already been approved by the City of Los Angeles.

- **Westside Medical Park** – Medical facilities consisting of the demolition of four buildings (approximately 226,368 square feet), construction of three medical offices (approximately 535,000 square feet), and an approximately 215,000 square-foot specialty surgical hospital on an 11.5-acre lot. The project is located near the intersection of Bundy Drive and West Olympic Boulevard (about five miles northeast of MDR) and is currently under review by the City of Los Angeles.

3.7 REQUIRED PERMITS AND APPROVALS

The wells associated with the lots proposed for sale were operated, maintained, and then abandoned under the general authority and supervision of DOGGR. The lots were originally plotted under the authority of the City of Los Angeles. It is necessary for the CPUC to approve this EIR as well as A.99-05-029 in order to complete the proposed sale of the 36 lots. Future development of the lots would be required to comply with existing zoning, building permits, and land use regulations, under the authority of the City of Los Angeles. Therefore, any future construction or active uses of the lots that would occur after the proposed sale would require approval from the City of Los Angeles. In addition to city building applications, permits and approvals may be necessary from the following agencies:

- Division of Oil, Gas & Geothermal Resources (DOGGR)
- South Coast Air Quality Management District (SCAQMD)
- City of Los Angeles
- County of Los Angeles
- California Occupational Health and Safety Administration (Cal/OSHA)
- Regional Water Quality Control Board (RWQCB)

CHAPTER 4

ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION

A. APPROACH TO ANALYSIS

PROJECT ASSUMPTIONS

The underlying considerations and assumptions that were used in this EIR to analyze the environmental impacts of the proposed divestiture project include the following:

- The sale of the 36 lots itself, transfer of property ownership of the 36 PDR and MDR lots from SCG to new owners, would not result in any direct significant environmental impacts.

- This EIR analyzes the reasonably foreseeable future development that would result from the sale of the lots, which would be development of urban land uses consistent with existing zoning and adjacent land uses. For this project, the reasonably foreseeable development associated with the proposed sale includes the construction and occupancy of residential housing units and commercial uses.[1] The CPUC, the lead agency for the project, would not have the authority to impose and enforce mitigation measures associated with the construction and occupancy of future buildings on the lots. However, this EIR identifies potential impacts that could result and suggests recommended mitigation measures that could and should be applied by other responsible agencies during subsequent environmental review and approval processes for future development projects as they occur.

- Because the lots would no longer be under the control of a regulated utility after their sale, the CPUC would not have the authority to enforce any mitigation measures related to possible future development of the lots. Nevertheless, the CPUC will consider such reasonably foreseeable future development and any resulting potential environmental impacts when certifying the Final EIR and considering approval of the proposed sale.

- It is unknown when the reasonably foreseeable future development associated with the proposed project would occur.

- Compliance with all applicable environmental laws, permits, and approvals for both the proposed sale and its reasonably foreseeable future development would be required and is thus assumed throughout this document.

- Approval of the proposed sale of the lots as well as reasonably foreseeable future development would not have any relationship to the continued operation of SCG's gas storage facilities or related systems.

[1] Cluster 5 (which is one single lot) is zoned for commercial uses and it is therefore assumed that a commercial use would be constructed and occupied on that lot.

POTENTIAL ENVIRONMENTAL RISKS

While the sale of the lots itself would not present any direct significant environmental impacts, reasonably foreseeable future development of the lots could result in environmental impacts. These potential environmental impacts are the overriding concerns of this environmental analysis and stem from the history of oil and gas exploration and extraction operations at the 36 lots proposed as well as the potential for methane gas migration from any leaking abandoned gas wells. The approach to address these concerns was based on use of previously documented scientific information and data gathered from field investigations of onsite conditions conducted for this EIR.

Between 2000 and 2004, in order to be able to accurately assess the potential environmental impacts of the proposed sale and its reasonably foreseeable future development, a series of studies and field investigations were conducted. **Table 4.A-1** provides a chronological summary of the studies that were conducted; the results of which were used to evaluate potential environmental impacts in this Draft EIR. Discussion of the analyses conducted and results from these field investigations (including testing for methane, soil contamination, and soil gas) of the lots are described in further detail in Sections 4.B, *Air Quality*, 4.F, *Public Health*, and 4.G, *Public Safety*.

HUMAN HEALTH RISK ASSESSMENT

Using the data gathered from field investigations a Human Health Risk Assessment (HHRA) for the 36 lots proposed for sale was completed in March 2004. The HHRA evaluated the potential human health risks associated with chemicals detected in various field data collection studies conducted by consultants for the CPUC Energy Division between 2000 and 2004. An HHRA is a formal process that combines information on how people could come into contact with chemicals (exposure) with information on the health effects of the chemicals (toxicity). This combined information is used to estimate the likelihood of an adverse health effect. Soil and groundwater samples were tested and evaluated for the presence of total petroleum hydrocarbons (TPH), the volatile organic chemicals including benzene, toluene, ethylbenzene, and xylene, and semivolatile organic chemicals, because cancer and noncarcinogenic risks could result from the chemicals if present in the soils at the 36 lots proposed for sale. The HHRA is presented in Appendix E.

METHANE HAZARDS

All of the 36 lots proposed for sale are located within an area designated as a “methane zone” by the City of Los Angeles. To evaluate potential methane hazards at the lots, in 2003, as part of the overall field testing a methane hazards analysis study was conducted on the lots proposed for sale.

A. APPROACH TO ANALYSIS

TABLE 1-1
CHRONOLOGICAL SUMMARY OF STUDIES CONDUCTED

Time Period	Investigator	Area of Environmental Concern	Purpose of Investigation	Findings
2000-2001	Giroux & Associates	Methane Hazards	Initial methane migration investigation conducted at Cluster 3 and Cluster 12	No clear methane risks identified. However, the study concluded that the results could not be considered representative of all lots.
2001	Giroux & Associates	Air Quality; Odors	To characterize the background levels of hydrogen sulfide (as source of odor) in the study area. Daily samples taken over five days.	Minimal indication of odors except near storm drains.
2000-2001	URS	Air Quality at PDR	Characterization of baseline air quality for methane, and THC.	Concentrations were low in general and within expected ranges for Los Angeles
2001	URS	Air Toxics	Monitored BTEX	Monitoring was performed during SCG PDR venting activities and no correlation was observed in the data.
2003	Methane Specialists and Sullivan Consulting	Methane; Odors	Surface sweep of all lots to determine if any methane was observed at ground level.	Concentrations were either non-detects or very low readings. No odors were detected.
2003-2004	Brown and Caldwell	Health hazards	Make detailed measurements of soil contamination and soil gas on all lots as well as groundwater at Cluster 12. Provide data for the health risk assessment. Repeat measurements over eight months to confirm results.	Sampling confirmed generally low levels of contaminates in most cluster soils. A health risk assessment utilizing these data shows no significant human health risk exists at the clusters.
2003-2004	Methane Specialists	Methane hazards	Working in concert with Brown and Caldwell, make subsurface methane measurements on the lots to determine if any existing methane hazards exist. If methane was measured, to determine the source of methane.	Methane was routinely detected at Cluster 11 below ground level. The source of this methane was attributed to be from decomposition of contaminated soils from historical oil exploration; not from SCG storage gas.
2004	Brown and Caldwell	Health hazards	Determine whether the “fifty-foot gravel layer” at Cluster 12 is presence or not.	Layer not found but clay layer identified at 55 feet would minimize vertical migration methane in the area.
2004	Gary Boettcher Consulting	Odors	Determine the levels in PDR of hydrogen sulfide odors over an extended time period.	While some interesting trends were observed in the data, the values are consistent with typical values for Los Angeles and do not appear to be correlated to SCG activities.

IMPACTS AND MITIGATION MEASURES

IMPACTS AND IMPACT SIGNIFICANCE

Impacts in this EIR are analyzed using the significance criteria that are defined at the beginning of each impact analysis section. Consistent with CEQA Statute 21083 and CEQA Guidelines 15065, significance levels as provided in the checklist are generally defined as follows:

- **Significant and unavoidable:** CEQA Guidelines 15382 defines a significant effect as "…a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project…" An economic or social change by itself is not considered to be a significant effect on the environment. An economic or social change related to a physical change may be considered in determining whether physical change is significant. An impact is considered to be unavoidable if no practical mitigation measure can be applied to reduce the impact to a less-than-significant level.

- **Less than significant with mitigation:** An impact is considered to be less than significant with mitigation when a significant project impact can be reduced to a less than significant level if identified mitigation measures are implemented.

- **Less than significant:** A less than significant impact is a project impact that would not result in a significant change to the environment.

MITIGATION MEASURES

Where it is determined that no impact would occur as a result of both the sale and future development of the lots, it is categorized as a less than significant impact. Mitigation measures "Identified in this EIR" are measures to be imposed by the CPUC or other responsible agencies as conditions of approval of the proposed sale. Mitigation measures "Recommended for Future Development" are identified to demonstrate how significant impacts that would result from reasonably foreseeable future development are typically mitigated. The mitigation measures for future development could be imposed by responsible agencies during environmental review of future development projects. However, the CPUC would not have any authority to impose and enforce such measures.

LEGAL BASIS FOR APPROACH TO THIS ANALYSIS

This EIR was developed in accordance with the CEQA rationale and basis for consideration of the reasonably foreseeable consequences associated with the proposed sale. CEQA Guidelines Section 15378(a) defines a "project" which is subject to CEQA as:

> "the whole of an action, which has the potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment ..."

In addition, CEQA Guidelines Section 15126.2(a) states:

> "[d]irect and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects."

CEQA Guidelines Section 15378 further explains that the above definition of "project" ensures that the action reviewed under CEQA is not the approval itself, but the development or other activities that would result from the approval. An EIR must analyze all aspects of a project that are a reasonably foreseeable consequence of the project in addition to the whole of an action that may result in a physical change to the environment.[2] Thus, a lead agency may not limit environmental disclosure by ignoring the development or other activity that would ultimately result from an initial approval.

The court decision of *Laurel Heights Improvement Association v. Regents of the University of California*, 47 Cal.3d 376, 396 (1988), provides further support to the analysis of future connected actions where the California Supreme Court held that:

> "an EIR must include an analysis of the environmental effects of future expansion or other action if: (1) it is a reasonably foreseeable consequence of the initial project; and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects."

The EIR had only examined the impacts of the University's plan to use part of an office building located in a residential neighborhood with laboratory facilities even though there was "credible and substantial evidence" in the record of the University's intent to occupy the entire building. The court held that the EIR was inadequate because it failed to discuss the anticipated future uses of the building and the environmental effects of those uses.[3]

The reasonably foreseeable future development connected to the sale of the 36 PDR and MDR lots is a reasonably foreseeable consequence of the sale of the land. Because it would change the scope and nature of the project and its environmental effects, this reasonably foreseeable consequence

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[2] See, City of Antioch v. City Council, 187 Cal.App.3d 1325, 1337 (1986) (where piecemeal review of development of infrastructure for undeveloped site resulting in negative declaration was considered improper, even though future developments of the site would be examined in later EIRs, because infrastructure extension was approved to allow site to be developed; the court noted "the sole reason to construct the road and sewer project is to provide a catalyst for further development in the immediate area. Because construction of the project could not easily be undone, and because achievement of its purpose would almost certainly have significant environmental impacts, construction should not be permitted to commence until such impacts are evaluated in the manner prescribed by CEQA."); see, also, Bozung v. LAFCO, 13 Cal.3d 263, 279, 281-282 (1975) (where the City proposal to annex agricultural land required preparation of an EIR because its ultimate effect would be to permit subdivision and development of land that had been in agricultural use); accord, Heninger v. Board of Supervisors, 186 Cal.App.3d 601 (1986) (where the County's amendment of septic tank ordinance to allow alternative private disposal system for single-family residences required preparation of an EIR; although only one lot owner sought amendment, ordinance could have significant environmental impacts because it could open way for development of other sites).

[3] See, also, City of Santee v. County of San Diego, 214 Cal.App.3d 1438 (1989) (where an EIR for a temporary jail facility was inadequate because it did not evaluate the impacts of long-term use; those impacts were a reasonably foreseeable consequence of the initial project because the probable need for jail facilities was projected to last longer than the temporary period set forth in the project description).

would be significant. As such, the impacts of the development of the 36 lots (and not simply their sale) are analyzed in this EIR.

B. AIR QUALITY

Air quality is a function of the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features that influence pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, and consequently affect air quality.

ENVIRONMENTAL SETTING

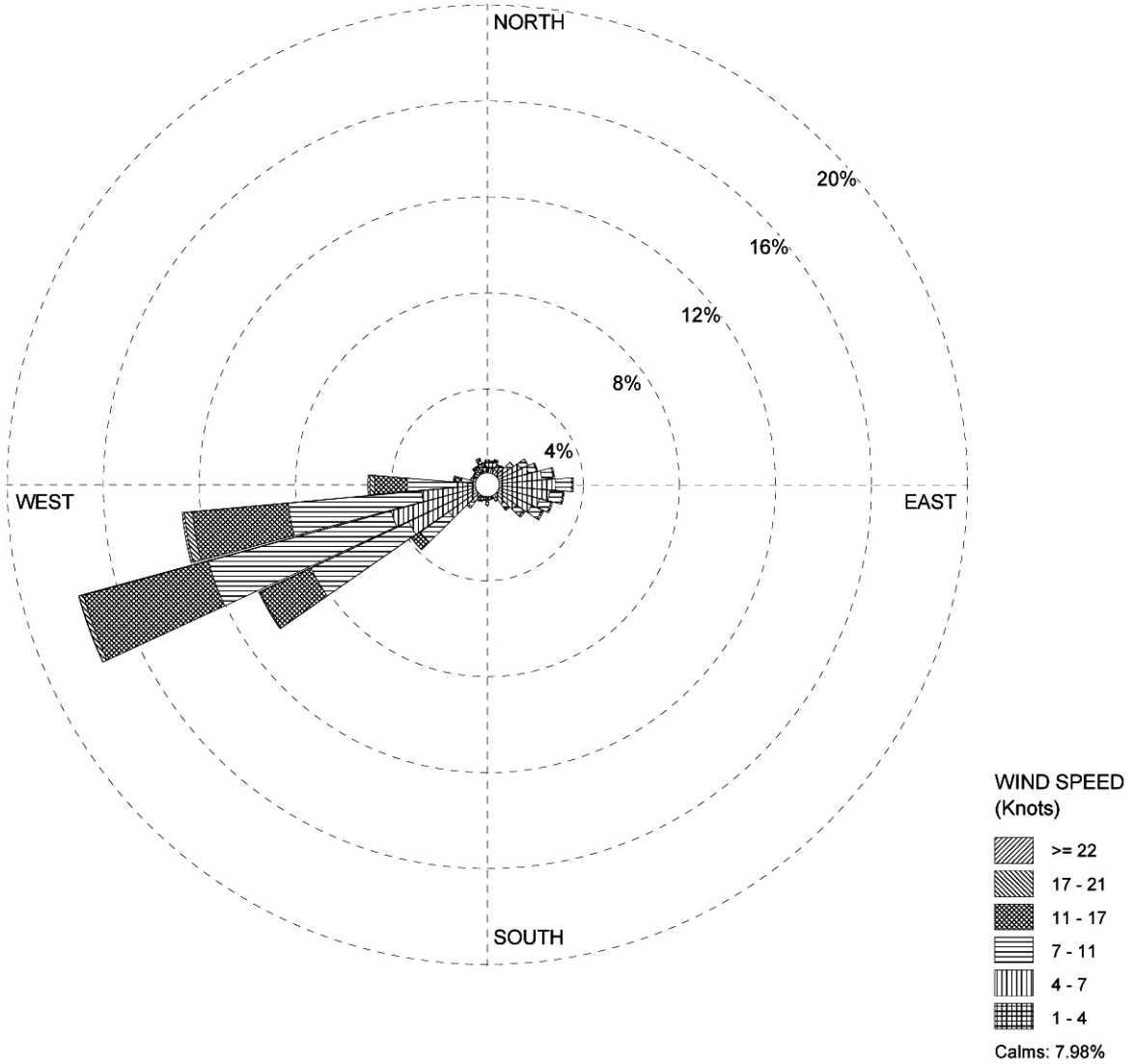
CLIMATE

The South Coast Air Basin (SCAB) is primarily a coastal plain with interconnected valleys and low hills progressing into high mountain ranges on the perimeter. The SCAB experiences a Mediterranean type of climate (dry summers and wet winters). The region is located within a semi-permanent high-pressure system that lies off the coast. As a result, the weather is mild, tempered by a daytime sea breeze and a nighttime land breeze. This mild climate is infrequently interrupted by periods of extremely hot weather, winter storms, and Santa Ana winds. Rainfall in the SCAB is primarily restricted from November through April, with highly variable rainfall totals from year to year. The average temperature is 63 degrees Fahrenheit. Climate varies within the Basin; temperatures on the coast tend to be lower than in the San Fernando Valley.

The SCAB has a low average wind speed of 5.7 miles per hour (mph) in downtown Los Angeles. Inland areas record slightly lower wind speeds, while coastal areas average approximately 8.5 mph. Wind speed and direction taken at Los Angeles International Airport (LAX), located approximately one mile south of PDR, is presented on **Figure 4.B-1.** These data show that wind directions in the PDR and MDR area tend to be strongly from the west-southwest with a secondary predominate wind direction from the east, with calm winds averaging about 8 percent of the time over a five-year period. Because of the low average wind speed, air contaminants in the SCAB do not readily disperse. On spring and summer days, most pollution is moved out of the SCAB through mountain passes or is lifted by the warm vertical currents produced by the heating of the mountain slopes. From late summer through the winter months, lower wind speeds and the earlier appearance of offshore breezes combine to trap pollution in the SCAB.

The SCAB is hampered by the presence of a persistent temperature inversion layer, which limits vertical dispersion of air pollutants. In a typical atmosphere, temperature decreases with altitude. In an inversion condition, temperature increases with altitude. As the pollution rises, it reaches an area where the ambient temperature exceeds the temperature of the pollution. This causes the pollution to sink back to the surface. This phenomenon acts to trap air pollution near the surface.

In summer, the longer daylight hours and bright sunshine combine to cause a reaction between hydrocarbons and nitrogen oxides (NOx) to form ozone. In winter, the greatest pollution problems include carbon monoxide (CO) and NOx (due in large part to mobile vehicles), which are trapped and concentrated by the inversion layer.



SOURCE: Environmental Science Associates

Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey Project / 202639

Figure 4.B-1

Wind Rose for Los Angeles International Airport: 1988-1992

POLLUTANTS OF CONCERN

Ozone

The most pervasive air quality problem in the SCAB is high ozone concentrations. While not emitted directly, ozone is a secondary pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic compounds and NOx. Significant ozone production generally requires about three hours in a stable atmosphere with strong sunlight. Ozone is a regional air pollutant because it is transported and diffused by wind concurrent with the photochemical reaction process. Motor vehicles are the major source of ozone precursors in the SCAB. During late spring, summer, and early fall, light winds, low mixing heights, and abundant sunshine combine to produce conditions favorable for maximum ozone production. Ozone causes eye and respiratory irritation, reduces resistance to lung infection, and may aggravate pulmonary conditions in persons with lung disease. Ozone is also damaging to vegetation and untreated rubber.

Carbon Monoxide

CO is a non-reactive pollutant emitted primarily by motor vehicles. Ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic and are also influenced by meteorological factors such as wind speed and atmospheric mixing. When strong surface inversions formed on winter nights are coupled with near-calm winds, CO from automobile exhaust becomes concentrated. The highest CO levels within the Basin are almost always measured during the winter. CO interferes with the transfer of oxygen to the blood. It may cause dizziness and fatigue and can impair central nervous system functions. The one-hour CO standard has not been exceeded at the monitoring station closest to the project area in the last five years.

Nitrogen Dioxide

There are two oxides of nitrogen which are important in air pollution: nitric oxide (NO) and nitrogen dioxide (NO2). NO, along with some NO2, is emitted from motor vehicle engines, power plants, refineries, industrial boilers, ships, aircraft, and railroads. NO2 is primarily formed when NO reacts with atmospheric oxygen in the presence of reactive organic compounds (ROC) and sunlight; the other product of this reaction is ozone. NO2 is the “whiskey brown” colored gas, more commonly known as smog, readily observed during periods of heavy air pollution. Concentrations of NO2 are highest during the late fall and winter. Nitrogen dioxide increases damage from respiratory disease and irritation, and may reduce resistance to certain infections. The state standard for NO2 has not been exceeded in the last five years in the project area.

Particulate Matter (PM)

PM10 and PM2.5 consist of particulate matter that is 10 microns[1] or less in diameter and 2.5 microns or less in diameter, respectively. PM10 and PM2.5 represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust and fume-producing

[1] A micron is one-millionth of a meter

industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (i.e., sulfates and nitrates) can cause lung damage directly, or can contain absorbed gases (i.e., chlorides or ammonium) that may be injurious to health. Particulates can also damage materials and reduce visibility.

The primary sources of PM10 emissions in the project area are primarily from urban sources, dust suspended by vehicle traffic and entrained road dust, and secondary aerosols formed by reactions in the atmosphere. Traffic generates particulate matter and PM10 emissions through entrainment of dust and dirt particles that settle onto roadways and parking lots. PM10 is also emitted by burning wood in residential wood stoves and fireplaces. Particulate concentrations near residential sources are generally higher during the winter, when more fireplaces are in use and meteorological conditions prevent the dispersion of directly emitted contaminants. PM10 standards have been exceeded on an average of 6.8 days per year in the project area between 1997 and 2001.

Toxic Air Contaminants

Toxic Air Contaminants (TACs) are pollutants known or suspected to cause cancer or other serious health effects such as birth defects. TACs may also have significant adverse environmental and ecological effects. Examples of TACs include benzene, diesel particulate, hydrogen sulfide, methylchloride, 1,1,1-trichloroethane, toluene, and metals such as cadmium, mercury, chromium, and lead. Health effects from TACs vary depending on the specific toxic pollutant but may include cancer, immune system damage, and neurological, reproductive, developmental, and respiratory problems.

According to the U.S. Environmental Protection Agency (EPA), approximately 50 percent of the TACs that humans are exposed to come from mobile source emissions. The EPA and the CARB are both concerned about diesel particulate matter emissions. In the March 29, 2001 Federal Register, EPA published its final rule to control emissions of hazardous air pollutants from mobile sources. CARB approved a comprehensive diesel risk reduction plan in September 2000.

The South Coast Air Quality Management District (SCAQMD) has published a Basin-wide air toxics study (SCAQMD, 2000). The SCAQMD study represents one of the most comprehensive air toxics studies ever conducted in an urban environment. The study was aimed at determining the cancer risk from toxic air emissions throughout the Basin by conducting a comprehensive monitoring program, an updated emissions inventory of toxic air contaminants, and a modeling effort to fully characterize health risks for those living in the Basin. The study concluded that the average carcinogenic risk in the Basin is approximately 1,400 in one million. Mobile sources (i.e., cars, trucks, trains, ships, aircraft, etc.) represent the greatest contributors. About 70 percent of all risk is attributed to diesel particulate emissions, about 20 percent to other toxics associated with mobile sources (including benzene, butadiene, and formaldehyde), and about 10 percent of all carcinogenic risk is attributed to stationary sources (which include industries and other certain businesses such as dry cleaners and chrome plating operations).

Hydrogen Sulfide

Hydrogen Sulfide (H_2S) is a colorless, flammable gas with a distinctive "rotten egg" odor. Anaerobic decay processes involving sulfur-bearing materials may create H_2S naturally. H_2S occurs naturally in crude petroleum, natural gas, volcanic gases, and hot springs. It can also result from bacterial breakdown of organic matter, such as vegetation (anaerobic conditions) and, human and animal wastes. In addition, H_2S can result from industrial activities, such as food processing, coke ovens, Kraft paper mills, tanneries, and petroleum refineries. Most commonly, H_2S is released from petroleum resource operations when underground natural gas contains a substantial fraction of H_2S. Whereas the cap rock over underground accumulations of such gas within various Los Angeles Basin oilfields is generally impermeable, compromise of that cap layer has occurred through petroleum extraction from wells drilled through the cap. Although abandoned wells are sealed to minimize future leakage of H_2S -bearing gas, some wells may leak with passing time. It is estimated that the background concentration of H_2S in the United States is between 0.11 and 0.33 parts per billion (ppb) (Boettcher, 2004).

Methane

Methane is a colorless, odorless, flammable gas, which is the main constituent of natural gas. In the past, methane migration, in the form of natural gas to surface areas, has resulted in fires and explosions. Some studies have hypothesized that natural gas can migrate up through abandoned well heads.[2] However, the origins of methane gas in soil vary and sources of methane gas may be either thermogenic or bacterial.

Thermogenic methane also called "petrogenic" originates from oil production areas formed from ancient organic material under head and pressure deep in the earth. These gasses may occur several thousand feet below the ground surface and tends to seep up to ground surface through natural or manmade channels in the soil or geology.

Bacterial methane sometimes referred to as "biogenic" gases, are found in a wide range of locations. Bacterial methane is formed from the anaerobic bacterial decomposition of buried organic materials. Sources of organic materials may be natural, such as those found in wetlands, peat bogs, tar sands, or simply organic silty soils. Some buried organic material is manmade, placed either intentionally or by accidental contamination, such as from sanitary landfills, agricultural soil contamination, fuel tank leaks, or sewer gas.

Benzene

A common by-product of gas and oil production is Benzene and other volatile organic compounds. Benzene is one of the most toxic of the aromatic hydrocarbons. Benzene is a common chemical that the public is exposed to each day. It is located within gasoline and vented into the atmosphere in small quantities at the local gas station. It is contained within cigarettes and exposes the average smoker to increased amounts of methane. It is also released from cars while they are warming up or sitting idle.

[2] Gas Migration from Oil and Gas Fields and Associated Hazards, Journal of Petroleum Science and Engineering, 9 (1993) 223-238 Department of Civil Engineering, University of Southern California, Gurevich, A.E., Endres, B.l., Robertson, J.O., and Chelingar, G.V.

ODORS

Humans have varying degrees of odor sensitivity and evoke a wide range of physiological and emotional reactions. Odors are often times complex mixtures of numerous compounds at extremely low concentrations and can be produced by physical, chemical, and biological processes. Because most odors are composed of many different gasses at extremely low concentrations, it is very difficult and expensive to determine an odor's exact composition, and sometimes source(s) and location(s).

Though offensive odors rarely cause any physical harm, they are unpleasant and can lead to public distress generating citizen complaints to local governments. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source, wind speed, and direction, and the sensitivity of receptors.

EXISTING AIR QUALITY

Regional

CARB and SCAQMD operate regional monitoring networks that measure the ambient concentrations of the six criteria pollutants. Existing and probable future levels of air quality in the project area can generally be inferred from ambient air quality measurements at the monitoring stations. The major pollutants of concern in the region are ozone and particulate matter.

The long-term ambient monitoring station located closest to the project sites is located in Hawthorne (W. 120th Street), approximately eight miles to the southeast of the project sites. Criteria pollutants, including CO, NO2, PM10, and SO2 are monitored at this station. The long-term ambient monitoring station located closest to the project site for PM2.5 data is North Long Beach (3648 North Long Beach Boulevard), approximately twelve miles to the southeast of the project sites. The most recent data available from these monitoring stations encompassed the years 1997 through 2002. Both stations are located in Los Angeles County and within the SCAB. Since the climate and wind characteristics of the area surrounding the project sites are similar to these nearby the monitoring stations, data is expected to be representative of the air quality conditions at the project sites. Table 4.B-1 shows a six-year summary of monitoring data collected from the nearby stations, compared with California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS or national standards).

Generally, the air quality trends have improved with the number of exceedances and concentrations of CO and NOx decreasing throughout the period. The SCAB is in non-attainment for both the federal and state ozone, CO, and PM10 standards. The State's one-hour ozone standard in the SCAQMD was exceeded six days in 1997 and once per year from 1999 through 2001; the overall trend is decreasing concentrations of ozone. The PM10 standard was exceeded 12 times in 2002, and at least four times a year from 1997 to 2001; the overall trend shows steady or slightly increasing concentrations of PM10. Concentrations of PM2.5 have been monitored at

TABLE 4.B-1
PROPOSED PROJECT AREA AIR POLLUTANT SUMMARY
1997–2002[a]

Pollutant	Standard[b]	1997	1998	1999	2000	2001	2002
Ozone							
Highest 1-hr average, ppm[c]	0.09	**0.113**	0.089	**0.154**	**0.095**	**0.098**	0.087
Number of standard excesses[d]		6	0	1	1	1	0
Highest 8-hr average, ppm[c]	0.08[f]	**0.089**	0.069	0.084	0.075	0.079	0.072
Number of standard excesses[d]		2	0	0	0	0	0
Carbon Monoxide							
Highest 1-hr average, ppm[c]	20.0	12.4	11.4	10.2	8.7	7.3	NA
Number of standard excesses[d]		0	0	0	0	0	
Highest 8-hr average, ppm[c]	9.0	**10.3**	**9.5**	8.4	7.1	5.2	NA
Number of standard excesses[d]		1	1	0	0	0	
Nitrogen Dioxide							
Highest 1-hr average, ppm[c]	0.25	0.164	0.150	0.134	0.128	0.110	NA
Number of standard excesses[d]		0	0	0	0	0	
Annual Arithmetic Mean, ppm[c]	0.053[f]	0.0276	0.0288	0.0287	0.0272	0.0244	NA
Particulate Matter-10							
Highest 24-hr average, $\mu g/m^3$ [c]	50	**79**	**66**	**69**	**74**	**75**	**121**
Number of standard excesses[d,e]		4	7	6	9	8	12
Annual Arithmetic Mean, $\mu g/m^3$ [c]	20	**35.5**	**32.5**	**32.5**	**36.0**	**37.1**	**37.3**
Particulate Matter-2.5							
Highest 24-hr average, $\mu g/m^3$ [c]	65[f]	NA	NA	**66.9**	**81.5**	**72.9**	62.7
Number of standard excesses[d,e]				1	4	1	0
Annual Geometric Mean, $\mu g/m^3$ [c]	12	NA	NA	**20.7**	**19.6**	**21.2**	**19.5**

NOTE: **Bold** values indicate an excess of applicable standard.

a Data are from the SCAQMD monitoring station located in Hawthorne. PM2.5 data is taken from SCAQMD monitoring station located in North Long Beach. At the time of this document's preparation, 2003 data was unavailable for all pollutants. However, ozone values of 0.110 ppm and 0.077 ppm were recorded for Hawthorne for the 1-hour and 8-hour standards respectively.
b State standard, not to be exceeded.
c ppm - parts per million; $\mu g/m^3$ - micrograms per cubic meter.
d Refers to the number of days in a year during which at least one excess was recorded.
e Measured every six days.
f The federal standard is shown because no state standard exists.

NA Not Available.

SOURCES: South Coast Air Quality Management District, *Air Quality Data Summaries*, 1997-2001 and California Air Resource Board, *Air Quality Data Summaries*, 1997-2001.

greater than the standards. The CO standard has not been exceeded in the project area for the last five years. The SCAB is a maintenance area for the federal and state NOx standards, which means it had once been in nonattainment.

Local

As part of the overall environmental analysis several additional field investigations were conducted in the PDR area to establish local levels of methane and odors.

Methane

An initial methane migration monitoring investigation was conducted at a representative well site in the PDR area at the Lor Mar well (Cluster 3) and at the Troxel well (Cluster 12) in MDR by Giroux & Associates (2001a). Giroux & Associates (2001a) conducted monitoring within a cavity created by encasing the subsurface wellhead within a hollow enclosure with surface access. Methane measurements were made with a flame ionization detector for organic gases (Photovac Micro-FID) for a month after equipment installation. The Troxel well probe encountered pockets of crude oil mixed with sand that apparently spilled when this was an operating oil well. The Giroux & Associates report found that home construction atop these two well sites would not result in any clear risks from methane migration (Giroux & Associates, 2001a). To this end, an in depth methane migration monitoring study at all twelve clusters was conducted to verify the conclusions reached in the last study and assist in a risk assessment of these properties.

URS conducted a one year air quality monitoring study of the PDR Gas Storage Field for SCG between September 2000 and September 2001 (URS, 2002). The program included continuous monitoring for concentrations of methane and total hydrocarbon compounds (THC). In general, none of the PDR Gas Storage Facility operations resulted in measurable impacts at the monitoring stations (URS, 2002). Monitored methane and THC values taken over the year long monitoring period were compared temporally to SCG data on vented gas amounts. No correlation was observed between SCG venting activities and monitored data (URS, 2002). Between April and September 2001, ambient air sampling for benzene, toluene, ethylbenzene, and xylene (BTEX) was conducted when concentrations of methane and THC reached predetermined sampling event triggering levels[3]. While samples were collected during periods when monitoring indicated that elevated levels of methane and THC were present, in general, all benzene and BTEX concentrations were low[4] and were within expected ranges for urban Los Angeles (URS, 2002).

In late May 2003, an additional detailed field study was conducted to determine if any of the clusters were sources of either methane and/or H_2S. Cluster dimensions were field approximated and a sampling grid was established. Each grid was no greater than 10 by 10 feet. A HeathTech DP III flame ionization detector (FID) was used to sample for methane. The FID had a sampling device equipped with a funnel cup at the end. The FID setting range was 0 to 50 parts per million

[3] Triggering of BTEX sampling occurred when methane levels exceeded 15 ppm and /or THC exceeded 30 ppm.

[4] One BTEX sample taken during September 10, 2001 observed benzene levels of 25 ppm for a short time period. However, this occurred during a maintenance activity on a gas well in the immediate vicinity of the sampler intake, when gas was vented to the atmosphere (URS, 2002).

by volume (ppmv). Measurements were collected by walking each grid and measuring within three inches of ground surface, or by "cupping" the end of the sampling device to the ground surface (Methane Specialists, 2003). The results indicated that the combustible gas concentrations were generally non-detectable at each cluster. Combustible gas concentrations of 1 to 2 ppmv were detected at Cluster 2; however, these data were likely due to instrument drift or represent background concentrations. There were no odors (olfactory) detected at any cluster during the monitoring periods.

Odors

The SCAQMD has recorded 60 odor complaints since 1988 in the vicinity of the PDR Gas Storage Facility[5]. In addition, several wells in the Ballona Wetlands and MDR area have been reported as "leaking" by various citizens and agencies.

In January 2001, Giroux & Associates performed screening level monitoring for H_2S. Utilizing passive sampling badges, 100 air samples were taken over a five-day period. The Giroux & Associates analysis concluded that except near storm drains, there was minimal indication of any H_2S. The analysis further stated that it is unknown if this observed material was due to biogenic decay within a large adjacent storm drain, due to a leaking well, or due to any SCG operations. Due to the uncertainty of this screening level monitoring, a more comprehensive H_2S monitoring program was undertaken in support of the analysis presented in this EIR.

The objective of this more comprehensive program was to collect and analyze semi-continuous air samples of reduced-sulfur compounds, namely, H_2S. Monitoring was completed to confirm work by Giroux & Associates (2001), to determine the magnitude and duration of H_2S concentrations in the vicinity of the PDR Gas Storage Facility, and to investigate whether the facility is a potential source of odorous H_2S. Additionally, monitoring was completed to determine H_2S concentrations and durations of unanticipated release(s) from the facility during normal operations or maintenance periods, should they occur during the monitoring period.

Two monitoring locations were established near the PDR Gas Storage Facility. Two Jerome® 631X Hydrogen Sulfide Analyzers were used and each instrument was enclosed in a protective case and located approximately two feet above the ground. The Southwest monitoring station was located at the SCG upper facility property boundary between the baseball field and the facility fence. The location was primarily under tree cover and resided on a bluff overlooking Falmouth Avenue and residential neighborhoods to the west.

The Northeast monitoring station was also located at the SCG upper facility near the residential neighborhoods located near the intersections of Veragua Drive and Zayanta Drive. The monitoring station was in a more open area approximately 50 feet from a bluff overlooking the SCG lower facility, Playa Vista, the Ballona Wetlands, and MDR.

H_2S concentrations in the air were measured from January 30, 2004 to March 11, 2004. During the period between January 30, 2004 and March 2, 2004, data were collected every 5 to

[5] South Coast Air Quality Management District Complaint Summary Report, April 18, 2003.

15 minutes. From March 2, 2004 to March 11, 2004, both instruments at each monitoring location were operating and data were collected every 5 minutes. Data collected during this period were similar to the preceding period (January 30, 2004 to March 1, 2004). Because the data from March 2, 2004 to March 11, 2004 were similar to the preceding period, both instruments were operating concurrently, and the sampling frequency was increased (5 minutes), data during this period were primarily used to evaluate H_2S concentrations at the SCG facility and are the subject of this evaluation report.

Southwest Monitoring Location. Figure 4.B-2 depicts the air-monitoring data collected from the Southwest monitoring location. The concentrations ranged from 0.002 to 0.14 ppm. In general, the measured concentrations fluctuated around a typical odor threshold of 0.008 ppm. These data are consistent with field observations indicating occasional, short duration olfactory H_2S odor, periodically detected while at the monitoring location.

There does not appear to be an apparent trend (diurnal) showing differences between "day-time" and "night-time" concentrations. There is a three-day cyclical trend showing gradual concentration increases and decreases as indicated by the data regression analysis expressed as a polynomial function (**Figure 4.B-2**). This apparent trend appears to be consistent with barometric pressure changes that occurred during the same time period (Boettcher, 2004).

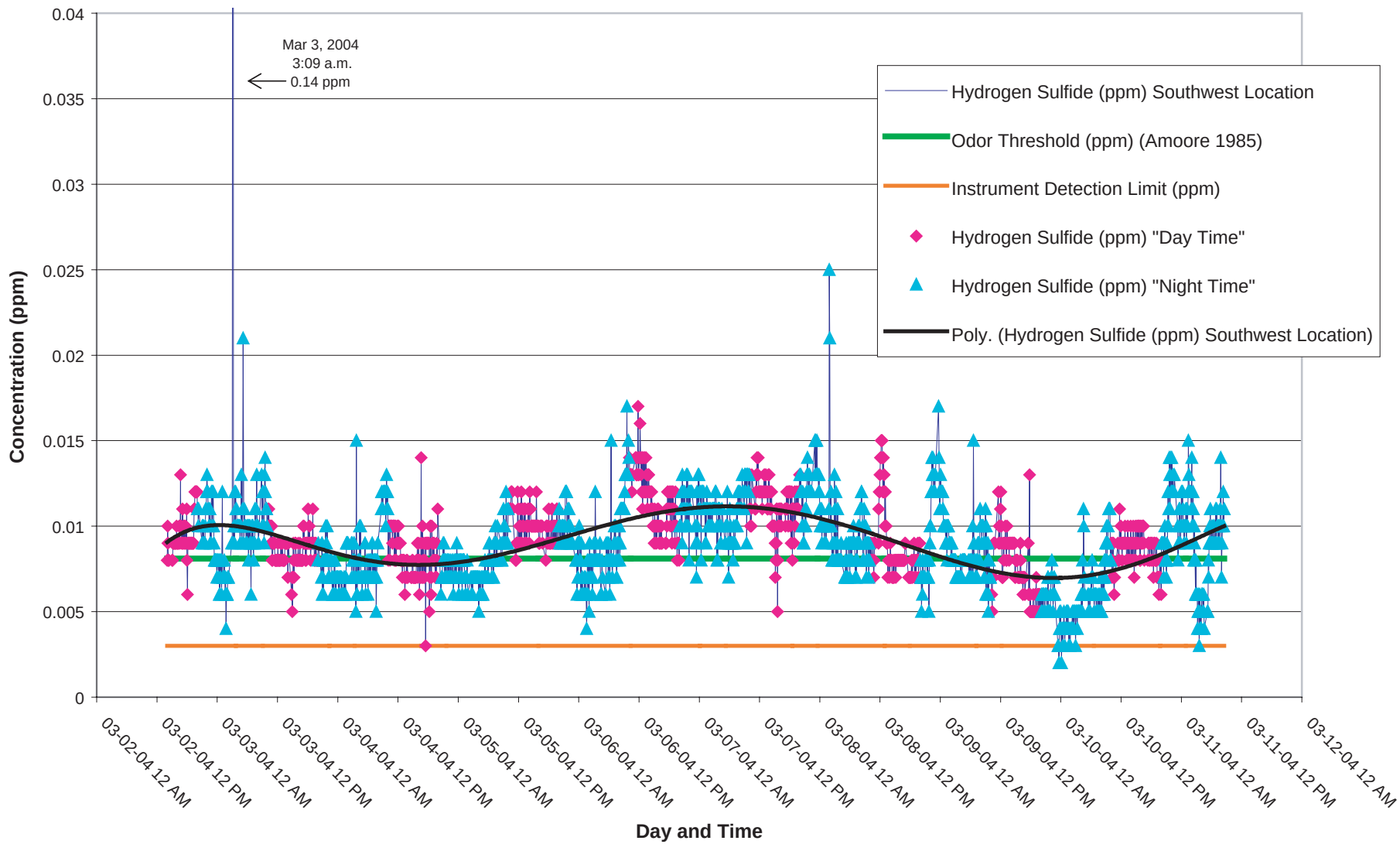
Northeast Monitoring Location. Figure 4.B-3 depicts the air monitoring data collected from the Northeast monitoring location. The concentrations ranged from 0.001 to 0.038 ppm. In general, the measured concentrations fluctuated around a typical odor threshold of 0.008 ppm. These data are consistent with field observations indicating occasional, short duration olfactory H_2S odor, periodically detected while at the monitoring location.

EXISTING AIR POLLUTION SOURCES

Air quality in the vicinity of the project sites is affected by emissions from permitted emission sources at the SCG PDR Gas Storage Facility, motor vehicle traffic on adjacent roadways and highways, operations at LAX, large stationary sources such as landfills, power plants, manufacturing and petroleum industries, and the cumulative effect of smaller stationary sources such as construction, dry cleaners, paints, and solvents.

SENSITIVE RECEPTORS

Some land uses are considered to be more sensitive to air pollution than others due to the types of population groups or activities involved. Residences, schools, playgrounds, childcare centers, convalescent homes, retirement homes, rehabilitation centers, and athletic facilities are included in SCAQMD's list of sensitive receptors. Sensitive population groups include children, the elderly, and the acutely and chronically ill, especially those with cardio-respiratory diseases. Residential areas are also considered to be sensitive to air pollution because residents tend to be home for extended periods of time, resulting in sustained exposure to any pollutant present.

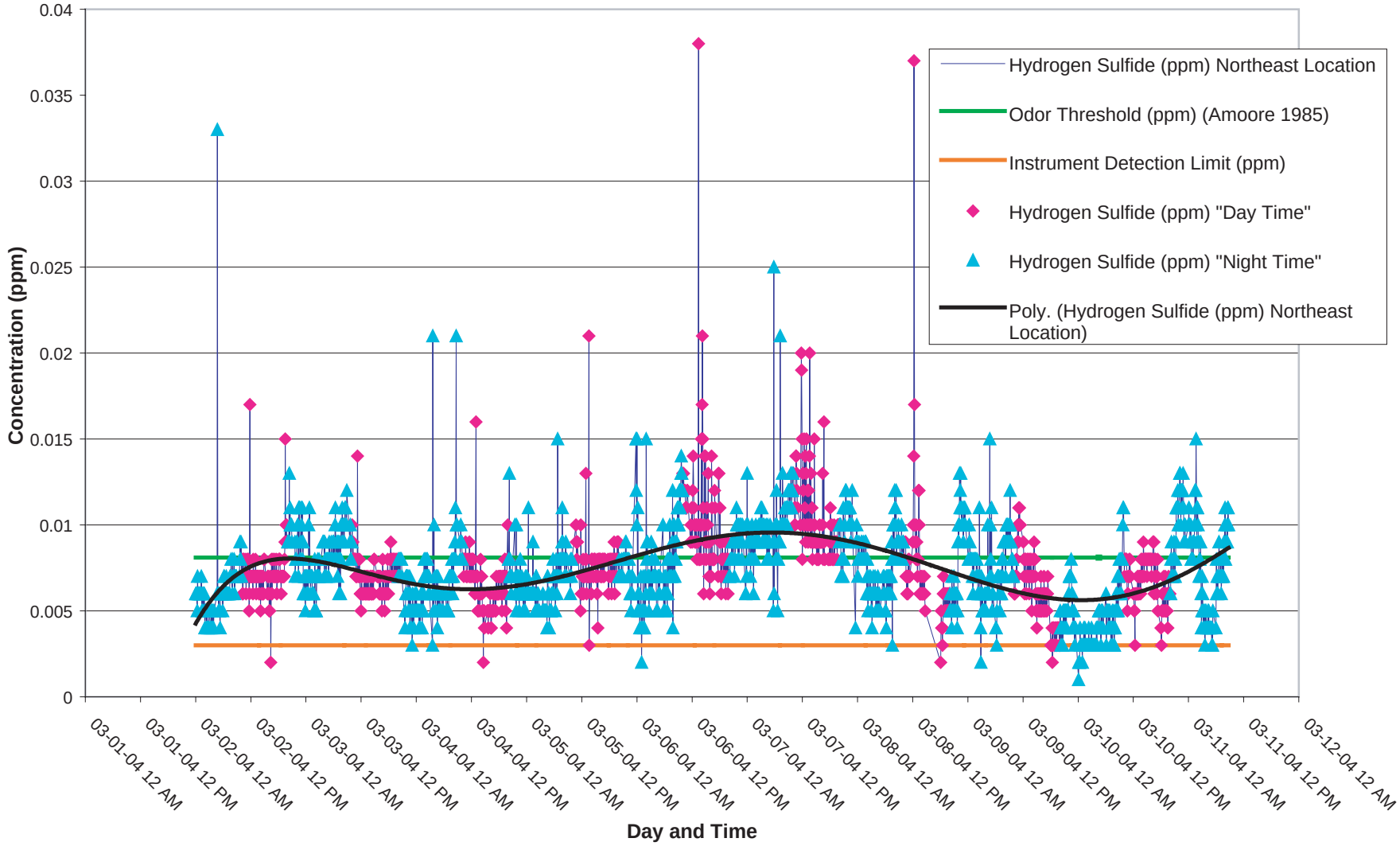


SOURCE: Environmental Science Associates

Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey Project / 202639

Figure 4.B-2

Hydrogen Sulfide Concentrations at the Southwest Boundary vs. Time



SOURCE: Environmental Science Associates

Figure 4.B-3
Hydrogen Sulfide Concentrations
at the Northeast Boundary vs. Time

APPLICABLE REGULATIONS, PLANS, AND POLICIES

Air quality within the SCAB is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The air pollutants of concern and agencies primarily responsible for improving the air quality within the Air Basin and the pertinent regulations are further discussed below.

FEDERAL

The United States Environmental Protection Agency (EPA) is responsible for implementing the myriad of programs established under the federal Clean Air Act, such as establishing and reviewing the NAAQS and judging the adequacy of State Implementation Plans (SIPs), but has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

Air pollution regulation is achieved through national and state ambient air quality standards and emission limits for individual sources of air pollutants. As required by the federal Clean Air Act, the EPA has identified criteria pollutants and established NAAQS to protect public health and welfare. NAAQS have been established for ozone, CO, nitrogen dioxide (NO2), sulfur dioxide (SO2), particulate matter equal to or less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), and lead (Pb). These pollutants are called “criteria” air pollutants because standards have been established for each of them to meet specific public health and welfare criteria.

The NAAQS are defined as the maximum acceptable concentration that may be reached, but not exceeded more than once per year. California has adopted more stringent ambient air quality standards for most of the criteria air pollutants (CAAQS or state standards). The national and state air quality standards are shown in Table 4.B-2. California has also set standards for PM2.5, sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles.

Areas are classified under the federal Clean Air Act (CAA) as either “attainment” or “non-attainment” areas for each criteria pollutant based on whether the NAAQS have been achieved or not. The SCAB is in non-attainment for the federal and state ozone, CO, and PM10 standards. The state one-hour ozone standard in the SCAQMD was exceeded 6 days in 1998 and at least once per year from 1997 through 2002 (see Table 4.B-2). The PM10 standard was exceeded 12 times in 2002, and at least eight times a year from 1997 to 2002. The CO standard has not been exceeded in the project area for the last five years. The SCAB is a maintenance area for the federal and state NOx standards, which means it had once been in non-attainment.

In addition to criteria pollutants, the EPA is concerned with Hazardous Air Pollutants (HAPs), which are substances with the potential to cause or contribute to an increase in mortality or an increase in serious illness, or may pose a present or potential hazard to human health. Title III of the 1990 CAA Amendments identified 189 HAPs. Control of toxic air emissions is implemented

TABLE 4.B-2
AMBIENT AIR QUALITY STANDARDS FOR CRITICAL POLLUTANTS

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour	0.09 ppm	0.12 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Motor vehicles.
	8 hours	---	0.08 ppm		
Carbon Monoxide	1 hour	20 ppm	35 ppm	Classified as a chemical asphyxiant, CO interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9 ppm	9 ppm		
Nitrogen Dioxide	Annual Average	---	0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.25 ppm	---		
	24 hours	0.04 ppm	0.14 ppm		
Respirable Particulate Matter (PM-10)	24 hours	50 µg/m^3	150 µg/m^3	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).
	Annual Average	20 µg/m^3	50 µg/m^3		
Fine Particulate Matter (PM-2.5)	24 hours	12 µg/m^3	65 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_X, sulfur oxides, and organics.
	Annual Average	---	15 µg/m^3		
Lead	Monthly	1.5 µg/m^3	---	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurologic dysfunction (in severe cases).	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	---	1.5 µg/m^3		

TABLE 4.B-2 (Continued)
AMBIENT AIR QUALITY STANDARDS FOR CRITICAL POLLUTANTS

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Hydrogen Sulfide	1 hour	0.03 ppm (42 $\mu g/m^3$)	---	Hydrogen Sulfide is a colorless, flammable gas. In low concentrations it smells like "rotten eggs." It is considered to be a toxic gas.	H_2S is used in metallurgy, the preparation of phosphorous and oil additives, as well as a reagent in chemical analysis. Other potential sources can include naturally-occurring H_2S from decaying biomass; H_2S gas from sewers, sewer vents, and storm drains.

a. Ambient air quality standards are set at levels which provide a reasonable margin of safety and protect the health of the most sensitive individual in the population.
b. ppm = parts per million and $\mu g/m^3$ = micrograms per cubic meter
c. A federal air quality standard for PM2.5 was adopted in 1997. Presently, no methodologies for determining impacts relating to PM2.5 have been developed. In addition, no strategies or mitigation programs for this pollutant have been developed or adopted by federal, state, or regional agencies.

SOURCE: California Air Resources Board, *Ambient Air Quality Standards*, July 9, 2003. http://www.arb.ca.gov/aqs/aaqs2.pdf

under Section 112 (HAPs) of the CAA. Implementation of the NAAQS to control criteria pollutants has also resulted in the reduction of toxic air contaminants.

Mobile source emissions are regulated in accordance with Title II provisions. These provisions require use of cleaner burning gasoline and other cleaner burning fuels such as methanol and natural gas. Manufacturers of on-road and off-road engines are also required to reduce tailpipe emissions of hydrocarbons and NOx.

STATE

The California Air Resources Board (CARB) is responsible for establishing and reviewing the state standards, compiling the California SIP, securing approval of that plan from EPA, and identifying TACs. CARB also regulates mobile emission sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air quality management districts, which are organized at the county or regional level. The county or regional air quality management districts are primarily responsible for regulating stationary sources at industrial and commercial facilities within their jurisdictions and for preparing the air quality plans

that are required under the federal Clean Air Act and California Clean Air Act. These regional air quality plans prepared by districts throughout the state are compiled by CARB to form the SIP. The local air districts also have the responsibility and authority to adopt transportation control and emission reduction programs for indirect and area-wide emission sources.

All air pollution control districts have been formally designated as attainment or nonattainment for each CAAQS. Serious or worse nonattainment areas are required to prepare air quality management plans (AQMPs) to include specified emission reduction strategies in an effort to meet clean air goals. The requirements include:

- Application of Best Available Retrofit Control Technology to all existing sources.
- Development of control programs for area sources (i.e., architectural coatings and solvents), and indirect sources (i.e., motor vehicle use generated by residential and commercial development).
- A District permitting system designed to allow no net increase in emissions from any new or modified emission sources.
- Implementation of reasonably available transportation control measures, and assurance of a substantial reduction in the growth rate of vehicle trips and miles traveled.
- Use of low emission vehicles by fleet operations.
- Sufficient control strategies to achieve a 5 percent or more annual reduction in emissions (or 15 percent or more in a three-year period) for ROCs, NOx, CO, and PM10. However, air basins may use an alternative emission reduction strategy which achieves a reduction of less than 5 percent per year under certain circumstances; and
- Demonstrating compliance with CARB's established reporting periods for compliance with air quality goals. A seven-year initial reporting period from January 1, 1988, to December 31, 1994, was established. Subsequent reporting periods occur every three years (i.e., 1997, 2000, 2003, etc.). The 1991 AQMP sought to achieve a 35 percent emissions reduction for the initial three-year period, followed by a 15 percent reduction in emissions within each subsequent three-year period.

REGIONAL

The SCAQMD regulates air pollutants regionally in the SCAB through the promulgation of rules and regulations and by issuing permits to operate to local industry. The SCAQMD adopted an AQMP in 1979, intended to meet federal air quality standards by December 31, 1987. Currently, the SCAQMD is operating under the 1997 AQMP and a 1999 amendment to the 1997 ozone portion of the AQMP. The SCAQMD has approved the Proposed 2003 AQMP for the SCAB. The 2003 AQMP demonstrates attainment with state and federal air quality standards and incorporates a revised emissions inventory, the latest modeling techniques, updated control measures remaining from the 1997/1999 SIP, and new control measures based on current technology assessments. Currently, the EPA is evaluating the adequacy of the 2003 AQMP.

In December of 1998, the SCAQMD revised its Rule 403 regarding fugitive dust emissions. The purpose of Rule 403 is to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions.[6] Under this rule, a person shall not cause or allow the emissions of fugitive dust from any active operation, open storage pile or disturbed surface area such that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source. Second, a person conducting active operations within the boundaries of the SCAB shall utilize one or more of the applicable best available control measures to minimize fugitive dust emissions from each fugitive dust source type which is part of the active operation. Third, a person shall not cause or allow PM10 levels to exceed 50 $\mu g/m^3$ when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high-volume particulate matter samplers or other EPA-approved equivalent method for PM10 monitoring. Finally, any person in the SCAB shall prevent or remove, within one hour, the track-out of sand, gravel, soil, aggregate material less than two inches in length or diameter, and other organic or inorganic particulate matter onto public paved roadways as a result of their operations; or prevent the track-out of such material onto public paved roadways as a result of their operations and remove such material at anytime track-out extends for a cumulative distance of greater than 50 feet on to any paved public road during active operations and remove all visible roadway dust tracked-out upon public paved roadways as a result of active operations at the conclusion of each work day when active operations cease.[7] The incorporation of mitigation measures contained within Rule 403 in addition to minimizing air emissions associated with the construction of projects assists in the compliance of SCAQMD AQMP objectives.

LOCAL

Local councils of governments, county transportation agencies, cities and counties, and various non-governmental organizations also join in the efforts to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs.

Southern California Association of Governments

The Southern California Association of Governments (SCAG) is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG serves as the federally designated metropolitan planning organization (MPO) for the southern California region and is the largest MPO in the United States. With respect to air quality planning, SCAG has prepared the Regional Comprehensive Plan and Guide for the SCAG region, which includes Growth Management, Air Quality, and Regional Mobility chapters that form the basis for the land use and transportation control portions of the SCAQMD AQMP and are utilized in the preparation of air quality forecasts included in the AQMP.

[6] SCAQMD. *Rule 403*. December 1998.
[7] *Ibid*.

Los Angeles County Congestion Management Plan

The Congestion Management Plan (CMP) for the County of Los Angeles has been developed to meet the requirements of Section 65089 of the California Government Code. In enacting the CMP statute, the State legislature noted the increasing concern that urban congestion was impacting the economic vitality of the State and diminishing the quality of life in many communities. The CMP was created to further the following objectives:

- To link land use, transportation, and air quality decisions.
- To develop a partnership among transportation decision makers to encourage appropriate transportation solutions that includes all modes of travel.
- To propose transportation projects which are eligible for State gas tax funds.

Los Angeles General Plan

The City of Los Angeles General Plan is a policy document and outlines guidelines for land use compatibility for development planning purposes. The Air Quality Element contains the following applicable air quality goals, objectives, and policies. The overall goal is to attain and maintain the National and State Ambient Air Quality Standards while continuing economic growth and improvement in the quality of life afforded to City residents and to document how the City plans to implement local programs contained in the regional plan.

- **Policy 1.3.1:** Minimize particulate emissions from construction sites.
- **Policy 1.3.2:** Minimize particulate emissions from unpaved roads and parking lots which are associated with vehicular traffic.
- **Policy 4.2.4:** Require that air quality impacts be a consideration in the review and approval of all discretionary projects.

SIGNIFICANCE CRITERIA

CEQA Guidelines provide the following thresholds for determining significance with respect to air quality. Air quality impacts would be considered significant if the project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standards or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentration; or,
- Create objectionable odors affecting a substantial number of people.

In addition, the SCAQMD has adopted air quality thresholds of significance for construction activities and project operations that are shown in Table 4.B-3.

TABLE 4.B-3
SCAQMD AIR POLLUTION SIGNIFICANCE CRITERIA
(POUNDS PER DAY)

Air Pollutant	Project Construction	Project Operation
Carbon Monoxide	550	550
Reactive Organic Compounds	75	55
Nitrogen Oxides	100	55
Particulates	150	150
Sulfur Dioxides	150	150

SOURCE: South Coast Air Quality Management District, 1993

ENVIRONMENTAL IMPACTS AND MITIGATION

An analysis of potential project-related impacts of PM10, NO2, CO, VOC, and air toxics (including diesel particulate matter) from construction and occupation of future development of the 36 lots proposed for sale was conducted. These impacts were compared to SCAQMD significance thresholds. Where significance thresholds were exceeded, mitigation measures were included to reduce impact levels to the extent feasible. In addition to these analyses, a qualitative analysis of the potential air toxics and odor impacts associated with the occupation of the future development is provided. The analysis was completed consistent with the SCAQMD CEQA Air Quality Handbook.

Impact B.1: Construction activities associated with future development of the 36 lots proposed for sale could temporally increase local pollutant concentrations of particulate matter (from fugitive dust) and carbon monoxide. (Less than significant with recommended mitigation)

The SCAQMD has established air emissions thresholds associated with construction projects. Construction-related emissions would primarily be: 1) dust-generated from grading and excavation; 2) hydrocarbon emissions from paints and asphalt; 3) exhaust emissions from powered construction equipment; and 4) motor vehicle emissions associated with construction activities. Future construction on the individual parcels could occur over a wide or narrow time frame depending on the individual developer's time schedules. A worst-case scenario would involve the simultaneous development of all 36 lots.

For planning purposes, the SCAQMD has published screening tables for construction projects to assess potential significance for air quality.[8] The SCAQMD has established a threshold for potentially significant air quality impacts at 1,309,000 square feet of construction per three-month period. Assuming that each house would be 3,000 square feet, future development on the lots could lead to a total construction of 105,000 square feet for residential properties. Similarly for Cluster 5, the one commercial property, a threshold of 559,000 square feet of construction is the SCAQMD threshold for significance. If the lots in Cluster 5 were to be fully developed, only approximately 20,000 square feet of commercial building space could result. As this future development would not exceed screening thresholds, construction associated with future development of the lots would not be anticipated to result in a significant air quality impact. Development of the PDR and MDR lots would not violate any air quality standard or contribute substantially to an existing or projected air quality violation and would therefore be less than significant. Although the size of future development is below SCAQMD significance thresholds, future construction would nonetheless be required to comply with SCAQMD Rule 403 (construction dust abatement requirements).

The use of heavy-duty diesel engines at the project sites could expose nearby residents to diesel particulate matter. Diesel particulate matter is a chemical known to the State of California to cause cancer in certain concentrations. Due to the relatively short-term exposure, nearby residents would not likely be exposed to substantial pollutant concentrations. As such, construction at the project sites is not expected to expose existing sensitive receptors (nearby residents) to substantial toxic air contaminants.

During future development of the lots, digging activities could cause a release of gas from the abandoned wells through the accidental damaging of the buried well heads. With proper marking of the abandoned wells and consideration of placement of future structures on the lots, it is unlikely that this potential impact would occur. This potential impact is further discussed in Section 4.G, *Public Safety*. Likewise, this potential impact and any potential mitigation measures to ensure avoidance of possible damage to buried well heads is considered in Section 4.G, *Public Safety*.

Recommended Mitigation Measure B.1: During future construction on the 36 lots, the future developer shall reduce PM-10 emissions from the various fugitive dust sources associated with future construction, and maintain the necessary documentation that demonstrates compliance with SCAQMD Rule 403. (Recommended for future development)

- **Cover all trucks hauling soil, sand, and other loose materials, or require all trucks to maintain at least two feet of freeboard.**
- **Pave, water (three times daily), or apply non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.**

[8] SCAQMD CEQA Air Quality Handbook, 1993, Table 6-3. Screening Tables for Construction-Quarterly Thresholds of Potential Significance for Air Quality.

- **Sweep all paved access roads, parking areas, and staging areas at construction sites daily with water sweepers.**
- **Sweep streets daily with water sweepers if visible soil material is carried onto adjacent public streets.**
- **Hydroseed or apply non-toxic stabilizers to inactive construction areas.**
- **Enclose, cover, water (twice daily), or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).**
- **Limit traffic speeds on unpaved roads to 15 miles per hour.**
- **Install sandbags or other erosion control measures to prevent silt runoff to public roadways during rainy season construction (November through April).**
- **Replant vegetation in disturbed areas as quickly as possible.**
- **All construction equipment shall be properly tuned and maintained.**
- **General contractors shall maintain and operate construction equipment so as to minimize exhaust emissions. During construction, trucks and vehicles in loading or unloading queues shall be kept with their engines off, when not in use, to reduce vehicle emissions.**
- **Construction activities shall be staged and scheduled to avoid emissions peaks, and discontinued during second-stage smog alerts.**

Significance after Recommended Mitigation: Less than Significant.

Impact B.2: Operational emissions associated with future development of the 36 lots proposed for sale could introduce additional emissions into the area that could conflict with applicable regional air quality plans. (Less than significant)

For planning purposes, the SCAQMD has published screening tables for operations to assess potential significance for air quality.[9] For residential housing units, the SCAQMD's threshold for potentially significant air quality impacts is 166 residential housing units.[10] Development of the 36 lots proposed for sale could result in the addition of up to 80 housing units (see Population and Housing section of the Initial Study prepared for this project and included as Appendix A of this EIR). Since the addition of 80 housing units would be less than the SCAQMD significance threshold, future development from the proposed sale would not result in a significant air quality impact. Operational emissions associated with future development of the lots in Cluster 5 for

[9] SCAQMD CEQA Air Quality Handbook, 1993, Table 6-2. Screening Tables for Operation-Daily Thresholds of Potential Significance for Air Quality.
[10] *Ibid.*

commercial use (approximately 20,000 square feet) would also not be anticipated to exceed SCAQMD significance thresholds for commercial properties.[11]

Mitigation: None required.

Impact B.3: Future development of the lots proposed for sale could expose sensitive receptors to hazardous pollutants from potentially leaking wells or existing contamination of the lots. (Less than significant)

Residential areas are considered to be sensitive to air pollution because residents tend to be home for extended periods of time, resulting in sustained exposure to any pollutant present. Given that the existing land uses are predominately residential in the PDR and MDR areas, all adjacent properties are considered to be sensitive receptors.

To assess potential impacts of the lots to sensitive receptors, an initial field monitoring study (Giroux and Associates, 2001a) was performed at two lot clusters (Cluster 3 in PDR and Cluster 12 in MDR) to assess the potential for methane migration at the lots proposed for sale. Although analysis of this initial testing concluded that subsurface migration was not occurring, Giroux & Associates, also concluded that the two lots where testing occurred could not be considered indicative of all 12 clusters (Giroux and Associates, 2001a). Because of this uncertainty, additional testing (including testing for methane, soil contamination, and soil gas) of the lots proposed for sale was performed, the results of which are described in further detail in Sections 4.E, *Geology*, 4.F, *Public Health*, and 4.G, *Public Safety*. Health hazards associated with impacts from potential gas migration are fully analyzed in Section 4.F, *Public Health*. Methane field testing showed that the combustible gas concentrations were generally non-detectable at each cluster and there were no odors (olfactory) were detected at any cluster during the monitoring periods (Methane Specialist, 2003).

During field investigations conducted in 2003, Brown and Caldwell identified toxic substances that could be present at the lots proposed for sale. Total petroleum hydrocarbons (TPH) were measured in the soil and in the soil vapor at the property clusters and the toxic components of TPH were identified (Brown and Caldwell, 2004). Based on these field investigations, a Human Health Risk Assessment (HHRA) was prepared to evaluate the findings of the field data investigations (Brown and Caldwell, 2004). As is presented in the discussion of Impact F.1 in Section 4.F, *Public Health*, health risks of the properties to local residents (sensitive receptors) is less-than-significant.

Foundations from future structures placed atop the abandoned oil and gas wells have the potential to force subsurface gases from any leaking well to migrate laterally under the building foundations and/or parking lots. While the extent of this migration depends greatly on a number of factors which include the amount of gas released and the measures used to seal the foundation etc., this circumstance has the potential to expose sensitive receptors that would not normally be

[11] *Ibid*.

exposed. Future development of the lots would be subject to the requirements of the City of Los Angeles and would include compliance with all requirements for construction over abandoned wells. The City of Los Angeles recently (2004) adopted a new and much more stringent building code for construction in areas prone to methane gas generation. The new building code expands the official methane zone from the older, more limited methane area in Los Angeles (Fairfax area well away from the PDR area) to now include all lands in the City overlying oil fields, plus a substantial buffer zone around the oil fields. The City code describes required mitigation measures for all structures in potential soil gas areas, whether or not gas is present. For areas where gas is present, additional measures including the venting of soil gas, constructing barriers to interrupt gas migration pathways, and, in cases where gas is present, monitoring gas in the soil and at structures are required.

The City of Los Angeles Fire Department also requires the placement of electronic gas detectors, mechanical ventilation, and alarms and the posting of warning signs when methane has been detected. The Los Angeles Fire Department must approve specifications on gas detection equipment and all plans for the placement of gas detectors. In addition, the Fire Department conducts performance evaluations of systems, including any mechanical ventilation systems, prior to authorizing occupancy of a structure that contains a methane gas system.

In summary, the results of the field sampling programs when considered with the findings of the HHRA, indicate that the 36lots do not pose a significant impact to sensitive receptors. Additionally, new methane mitigation requirements recently adopted by the City of Los Angeles would also ensure that this impact would be less than significant.

Mitigation: None required. Because future development of the 36 lots proposed for sale would be subject to the requirements of the City of Los Angeles. The City Building Code describes required mitigation measures for all structures in potential soil gas areas; whether or not gas is present. For areas where gas is present, additional measures are required. These include the venting of soil gas, constructing barriers to interrupt gas migration pathways, and, in cases where gas is present, monitoring gas in the soil and at structures. Thus, no additional mitigation measures would be necessary.

Impact B.4: Future development of the 36 lots proposed for sale could create objectionable odors affecting a substantial number of people or expose future residents to objectionable odors from the lots. (Less than significant)

Odors, while not toxic at low levels, represent a nuisance to the public. Based on the lack of detection of natural gas in results from field investigations described in the Setting above, it is unlikely that natural gas (which is mostly methane) would be released as a direct result of the sale of the lots. However, if the abandoned wells on the lots leak during construction or occupation of future development, new and existing residents could be exposed to objectionable odors. Odors due to natural gas are primarily associated with H_2S, which is a component of natural gas, and mercaptans, which are added to natural gas for safety purposes. Historically, odors related to

methane have been reported as noticeable in the PDR area and have, at times, been attributed to PDR Gas Storage Facility operations because the PDR Gas Storage Facility does release gas on an as-needed basis from its vent systems, and experiences fugitive leaks from valves, flanges, and other piping at the facility. However, other potential sources can include naturally-occurring H_2S from decaying biomass; H_2S gas from sewers, sewer vents, and storm drains; and naturally-occurring H_2S gas from the nearby wetlands (Ballona Wetlands).

Historically since 1998, the SCAQMD has investigated 60 odor complaints in the vicinity of the PDR Gas Storage Facility (SCAQMD, 2003). According to SCAQMD, a significant odor impact is defined as odors that are perceptible to more than 10 residents from any single source (Krause, 2003). Odor complaint frequency in the PDR area is strongest downwind of the PDR Gas Storage Facility during light morning on-shore breezes (Krause, 2003).

As described in the Setting, field testing was conducted in May 2003 to determine the extent to which the 36 lots themselves represent potential odor sources. From this field test, the following conclusions were reached for all Clusters considered in this study:

- During the survey, no significant combustible gas seeps were detected at ground surface within any cluster.
- During the survey, H_2S monitoring data indicated that no significant seeps were detected at ground surface within any cluster.
- H_2S concentrations in ambient air were similar to concentrations detected at ground surface and indicated no significant odorous H_2S sources within or around each cluster.
- There were no olfactory odors detected at any cluster during the survey.

As the addition of future residences to the PDR and MDR area could result in an increase in the number of sensitive receptors exposed to methane releases from local sources and associated odors, a detailed odor monitoring project was conducted in the PDR area in Winter 2004 (Boettcher, 2004).

Odor Monitoring Conclusions

The odor monitoring data was review for daily trends in odor concentrations. The Winter 2004 PDR odor data does not show any apparent diurnal (daily) tend that would indicate differences between “day time” and “night time” observed concentrations. A three-day cyclical trend was observed which shows gradual increases and decreases in monitored odor concentrations as indicated by the polynomial data regression analysis shown[12] on **Figures 4.B-2 and -3**. This apparent trend appears to be consistent with barometric pressure changes that occurred during the sampling period (Boettcher, 2004). The following general points can be concluded based on odor monitoring results:

[12] The dark black line shown on Figures 4.B-2 and -3 noted a “poly” represent the daily trend in the monitored data as derived by polynomial regression.

- Reduced sulfur compounds, likely H_2S, are present in ambient air at and near the SCG facility. The mean concentrations are approximately 0.008 to 0.009 ppm, significantly below State or occupational regulatory standards.

- There are no apparent diurnal, "day-", or "night-time" trends associated with either data set. Rather, H_2S concentrations in the air may slightly fluctuate with barometric pressure.

- There were no reported or detected releases from the SCG facility due to normal operations or maintenance activities during the monitoring period. This is evidenced by no relatively high and sustained concentrations detected.

- The H_2S concentrations measured from both monitoring locations (Southwest and Northeast of the SCG PDR facility) during the "day" and "night" (downwind and upwind), do not likely represent significant and/or continuous H_2S emissions from the SCG upper facility from January 30, 2004 to March 1, 2004, and especially from March 2, 2004 through March 11, 2004, when both instruments were operating and collecting data at a relatively high frequency. This is indicated by the lack of consistent and significantly higher H_2S detected by monitoring instruments during likely downwind time periods.

- The concentrations of H_2S detected downwind of the SCG upper facility represent background concentrations in the PDR area.

In summary, odor monitoring data show that the lots do not significantly contribute to odor emissions and that H_2S levels in the PDR area are below permissible odor standards. While future development of the 36 lots proposed for sale would result in a modest increase in the number of residents in the area (Appendix A – Population and Housing), the lots proposed for sale are spread out over already established neighborhoods and any odor event would be noticed by existing residents as well. Thus, the frequency of odor complaints would not be expected to change significantly and have a less-than-significant odor impact.

Mitigation: None required.

CUMULATIVE IMPACTS

Impact B.5: Future development of the 36 lots proposed for sale, when combined with other local projects, could result in a cumulative air quality impact. (Less than significant)

Air emissions in the SCAB are regulated by the SCAQMD. Pursuant to the CAA, the SCAQMD is required to reduce emissions of criteria pollutants for which the SCAB is in non-attainment. Strategies to achieve these emissions reductions are developed in the AQMP prepared by SCAQMD (2003) for the region. Chapter 3 of the 1997 AQMP states, "future emissions forecasts are based on demographic and economic growth projections provided by the Southern California Association of Governments (SCAG)." Individual projects and long-term programs within the region are required to be consistent with population, employment, and housing projections. Currently, the City of Los Angeles is updating the Westchester Community Plan and

General Plan Framework. The update to the Westchester Playa del Rey Community Plan and General Plan Framework Element plans for a population increase of 42,586 people over the next twenty years. The population increase would lead to a planned increase of 24,443 housing units in the Plan area.

Future development of the 36 lots proposed for sale could result in the construction and occupancy of approximately 80 housing units. This future development has been accounted for in the planning assumptions for the City of Los Angeles Community and General Plan framework. The City of Los Angeles is currently updating the Westchester Community Plan. This update will include plans for a population increase of approximately 42,586 people over the next 20 years. This population increase would lead to a planned increase of 24,443 housing units in the Plan area (see Population and Housing section of the Initial Study prepared for this project and included as Appendix A of this EIR). Future development would comprise less than one percent of the planned homes for the planning area. According to SCAG population projections, future development of the 36 lots would be consistent with SCAG housing projections and as such, would be consistent with the AQMP. Therefore, future development of the project lots would not conflict with or add unaccounted for impacts to planned implementation of applicable air quality plans and would therefore represent a less than significant cumulative impact.

Mitigation: None required.

REFERENCES – Air Quality

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C. BIOLOGICAL RESOURCES

Environmental Science Associates (ESA) conducted biological reconnaissance surveys in March 2003 at the MDR and PDR lots to update past reconnaissance surveys conducted by the Chambers Group in March 2000. Both the ESA 2003 and Chambers Group 2000 surveys documented existing biological conditions and assessed potential habitat for special-status plant and wildlife species. Species-specific surveys conducted for the project include:

- Special-status invertebrate species survey at MDR and PDR (Arnold, 2003) (see Appendix B)
- Burrowing owl surveys, which were equivalent to Phase I, II, and III of protocol surveys developed by the Santa Cruz Predatory Bird Research Group (Chambers Group, 2000)

ENVIRONMENTAL SETTING

The MDR and PDR lots lie within the South Coast subregion of southwestern California (Hickman, 1993). This subregion primarily supports a mosaic of coastal sage scrub, chaparral, and annual grassland habitats. Most of this subregion which extends from Santa Barbara to the Mexico border has been urbanized, resulting in a great loss of habitat.

MDR and PDR are located on the Southern California coast at Santa Monica Bay. Current land uses within the project area include commercial, residential and open space. The lots are situated within an urban environment and lie outside the boundaries of the Coastal Zone (see Section 10, Land Use and Planning). The MDR lot (Cluster 12) lies north of the entrance of Marina del Rey Channel. The site is bordered by residential apartment buildings on the north and south, Venice Beach on the west, and a paved alleyway on the east. The PDR lots (Clusters 1–11) are approximately one-half mile south of Ballona Creek and its associated wetlands, one mile east of Dockweiler Beach State Park, and one mile north of the Los Angeles International Airport (LAX). The PDR lots are on the plateau of a coastal bluff from which a steep cliff descends approximately 100 feet to the Ballona wetlands. The bluff itself is relatively flat. The Ballona wetlands support both non-degraded and degraded wetlands, agricultural fields (which were formerly wetlands), and upland areas designated as environmentally sensitive by the California Department of Fish and Game (CDFG) (Los Angeles County, 1995). A residential and private open space buffer zone separates the PDR project lots from the Ballona Creek wetlands area.

VEGETATION

In March 2003, ESA conducted a reconnaissance survey at MDR. During this period, the Cluster 12 site supported a small, degraded coastal dune scrub plant community. The site had been seeded with an ornamental wildflower mix, but also supported some native species, including dune tansy (*Tanacetum camphoratum*) on a sand mound. The dominant non-native species included iceplant (also commonly referred as hottentot fig) (*Carpobrotus edulis*) and barley (*Hordeum* species). Sea rocket (*Cakile edentula*), a common non-native dune plant, was also

observed on the sand mound. Following ESA's site reconnaissance survey, the site was substantially disturbed. Much of the vegetation was removed, notably the ornamental wildflowers and iceplant. The sand mound, which supported dune tansy and sea rocket, was leveled. The site (Cluster 12) currently supports mostly annual grasses.

The PDR lots are of varying sizes.[1] Most sites are surrounded by residential uses, such as adjacent lots with one-family residences or small apartment buildings and residential streets. The sites at PDR support primarily non-native, ornamental vegetation on disturbed sandy soils. The dominant plant species observed include iceplant, English ivy (*Hedera helix)*, and landscaping lawn grass. Eucalyptus (*Eucalyptus globulus*) is the dominant tree species observed at most of the sites. About half of the sites are routinely mowed, completely or partially, for aesthetics and fire reduction. Herbicides are used to maintain weeds at these sites. In areas that are not mowed, ruderal vegetation has established, including non-native annual grasses and herbs.

ANIMALS

Very few wildlife species were detected during the surveys (Chambers Group, 2000). Those animals detected and expected at the site are indicative of the urban landscape, which covers the project area. Wildlife species typical of urban areas were observed, including American crow, sparrow, house finch, European starling, domestic pigeon, and rock dove. Common insects, including ants, honey bees, and solitary bees, were also observed at most of the sites. Trees larger than 12 inches in diameter at breast height (dbh) were surveyed for the presence of raptor nests, but none were found. Although many native bird species inhabit the Ballona wetlands near the project, the MDR and PDR lots provide little or no biological value to those birds. No native mammal species were detected during the surveys, other than domestic dogs (*Canis familiaris*) and cats (*Felis domesticus*). Mammals that typically inhabit urban sites include black and Norway rat (*Rattus rattus* and *R. norvegicus*) and house mouse (*Mus musculus*). Although none were observed in site surveys, they can be expected to be present on the lots proposed for sale.

SPECIAL-STATUS SPECIES

Based on electronic database searches using the California Natural Diversity Database (CNDDB) (CDFG, 2003) and the California Native Plant Society Electronic Inventory (CNPS, 2003), 46 species were considered in evaluating the potential occurrence of special-status species at the PDR and MDR lots (Table 4.C-1). These include eight special-status plants and 38 special-status animal species. Only those species that have a reasonable potential to be affected by future development through habitat loss or construction-related disturbance are discussed below. These species include globose dune beetle, monarch butterfly, and special-status avian species protected under the Migratory Bird Treaty Act and Sections 3503, 3503.5, 3511, and 3800 of the California Fish and Game Code.

[1] Refer to *Biological Technical Report for Sale of SoCal Gas Properties Playa del Rey and Marina del Rey* (Chambers Group, 2000) for a description of vegetation at each lot (see Appendix D).

TABLE 4.C-1
POTENTIAL OCCURRENCE OF SPECIAL-STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR AND MDR LOTS

Common Name *Scientific Name*	**Status** FWS/CDFG/ CNPS	**General Habitat**	**Potential to Occur at PDR and MDR Lots**
		LISTED SPECIES	
PLANTS			
Ventura marsh milk-vetch *Astragalus pycnostachyus* var. *lanosissimus*	FE/CE/1B	Coastal salt marsh.	**Low Potential.** Only known at one site in Ventura County. Historically occurred at Ballona marshes on north side of MDR in early 1900s. No suitable habitat at PDR and MDR lots.
San Fernando Valley spineflower *Chorizanthe parryi var fernandina*	FSC/CE/1B	Coastal dune scrub.	**Low Potential.** Reported near Ballona Creek at MDR in early 1900s. Potential habitat but not observed during surveys.
Beach spectaclepod *Dithyrea maritima*	FSC/CT/1B	Coastal sand dunes and coastal scrub.	**Low Potential.** Observed at Ballona marshes at MDR in early 1900s. Potential habitat but not observed during surveys.
ANIMALS			
Mammals			
Pacific pocket mouse *Perognathus longimembris pacificus*	FE/CSC	Sandy to rocky soils in coastal sage scrub in southern coastal plains; possibly extinct.	**Low Potential.** Historically occurred at MDR in 1938. Suitable habitat for this species does not occur within the PDR and MDR Lots.
Birds			
Western snowy plover (nesting colony) *Charadrius alexandrinus nivosus*	FT/CSC	Sandy beaches on marine and estuarine shores; requires sandy, gravely, or friable soils for nesting.	**Low Potential.** Historically nested at PDR and Dockweiler State Beach, 1894–1914. No suitable nesting habitat at PDR and MDR lots.
California black rail *Laterallus jamaicensis coturniculus*	FSC/CT	Coastal salt marsh.	**Low Potential.** Reportedly occurred at PDR in 1928. No suitable nesting habitat at PDR and MDR lots.
Belding's savannah sparrow *Passerculus andwhichensis beldingi*	FSC/CE	Nests in Southern California coastal marshes; frequents pickleweed in a few scattered saline emergent wetlands from Santa Barbara County south. Nests on the ground under vegetation.	**Low Potential.** Reported on south side of Ballona Creek west of Culver Boulevard and Jefferson Blvd. intersection in 2001. No suitable nesting habitat within PDR and MDR lots.

TABLE 4.C-1 (Continued)
POTENTIAL OCCURRENCE OF SPECIAL-STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR AND MDR LOTS

Common Name *Scientific Name*	**Status FWS/CDFG/ CNPS**	**General Habitat**	**Potential to Occur at PDR and MDR Lots**
		LISTED SPECIES (cont.)	
Birds (cont.)			
Coastal California gnatcatcher (nesting) *Polioptila californica californica*	FT/CSC	Low coastal sage scrub in arid washes, on mesas and slopes.	**Low Potential.** Reported at Baldwin Hills in Culver City vicinity. No suitable nesting habitat within PDR and MDR lots.
California least tern (nesting colony) *Sterna antillarum browni*	FE/CE	Nests along the coast from San Francisco Bay south to northern Baja California; colonial breeder on bare or sparsely vegetated flat substrates, including sand beaches, alkali flats, land fills, or paved areas.	**Low Potential.** Observed nesting at MDR and PDR in 1996 and 1987. No nesting habitat at PDR and MDR lots.
Invertebrates			
El Segundo blue butterfly *Euphilotes battoides allyni*	FE/--	Coastal dunes with adult and larva host plant *Eriogonum parvifolium.*	**Absent.** Populations known from three fragments of habitat, with El Segundo Dunes west of LAX Airport being the largest site. No suitable habitat observed at PDR and MDR lots. Not observed during special-status invertebrate species surveys (Appendix B).
		SPECIES OF SPECIAL CONCERN	
Mammals			
Pallid bat *Antrozous pallidus*	--/CSC	Roost in caves, crevices, open buildings, mines, and tunnels, feeding mostly on ground insects; locally common species of low elevations in California.	**Low Potential.** No reported occurrences. Suitable habitat for this species does not occur at the PDR or MDR lots.
Western mastiff bat *Eumops perotis*	FSC/CSC	Roosts in crevices on cliff faces, high buildings, trees, and tunnels, foraging on high flying insects; uncommon resident in southeastern San Joaquin Valley and Coastal Ranges from Monterey County southward through Southern California, from the coast eastward to the Colorado Desert.	**Low Potential.** No reported occurrences. Suitable habitat for this species does not occur at the PDR or MDR lots.
Long-eared myotis *Myotis evotis*	FSC/--	Roosts in buildings and crevices, under bark and snags, feeding on arthropods; occurs along the entire coast.	**Low Potential.** No reported occurrences. Suitable habitat for this species does not occur at the PDR or MDR lots.

TABLE 4.C-1 (Continued)
POTENTIAL OCCURRENCE OF SPECIAL-STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR AND MDR LOTS

Common Name ***Scientific Name***	**Status** **FWS/CDFG/** **CNPS**	**General Habitat**	**Potential to Occur at PDR and MDR Lots**
		SPECIES OF SPECIAL CONCERN (cont.)	
Mammals (continued)			
Townsend's big eared bat *Plecotus townsendii townsendii*	FSC/CSC	Roosts in caves, mines, tunnels, and buildings, feeding on moths; found in all but subalpine and alpine habitats, and may be found during any season throughout its range; abundant in mesic sites.	**Low Potential.** No reported occurrences. Suitable habitat for this species does not occur at the PDR or MDR lots.
Yuma myotis *Myotis yumanensis*	FSC/CSC	Roosts with other species in buildings, mines, caves, and crevices, feeding on flying insects; found in a wide variety of habitats ranging from sea level to 11,000 feet, but it is uncommon to rare above 8000 feet; optimal habitats are open forests and woodlands with sources of water over which to feed.	**Low Potential.** No reported occurrences. Suitable habitat for this species does not occur at the PDR or MDR lots.
Birds			
Burrowing owl *Athene cunicularia*	FSC/CSC	Open, flat, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation with ground squirrel burrows.	**Low Potential.** Reported in vicinity of PDR at junction of Culver Boulevard and Jefferson Boulevard. Potential habitat on less disturbed sites near open space (e.g., Cluster 8, 10 and 11). Not observed during Chambers Group 2000 surveys.
Reptiles			
Southwestern pond turtle *Clemmys marmorata pallida*	FSC/CSC	Lakes, ponds, reservoirs, and slow-moving streams and rivers, primarily in foothills and lowlands.	**Low Potential.** Reported at MDR in 1987. No suitable habitat at PDR and MDR lots.
Invertebrates			
Sandy beach tiger beetle *Cicindela hirticollis gravida*	FSC/--	Clean, dry, light-colored sandy areas adjacent to non-brackish water.	**Absent.** Reported on Dockweiler Beach at PDR in 1979, about one-third mile west of project site. Not observed during special-status invertebrate species surveys (Appendix B).
Globose dune beetle *Coelus globulus*	FSC/--	Foredunes and sand hummocks; burrows beneath sand surface typically under dune vegetation.	**Present.** Historically occurred on foredunes bordering Dockweiler Beach. Marginally suitable habitat occurs at Cluster 12 (MDR).

TABLE 4.C-1 (Continued)
POTENTIAL OCCURRENCE OF SPECIAL-STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR AND MDR LOTS

Common Name ***Scientific Name***	**Status** **FWS/CDFG/** **CNPS**	**General Habitat**	**Potential to Occur at PDR and MDR Lots**
		SPECIES ON OTHER LISTS	
PLANTS			
Southern tarplant *Centromadia parryi* subspecies *australis*	--/--/1B	Margins of marshes and swamps, in grassland, and in vernal pools often on disturbed sites.	**Low Potential.** Occurred at Ballona marshes at MDR in early 1900s; not observed in 1997. No suitable habitat at PDR and MDR lots.
Orcutt's pincushion *Chaenactis glabriuscula var. orcuttiana*	--/--/1B	Coastal bluff scrub and coastal dunes.	**Low Potential.** Reported at Dockweiler Beach at PDR in 1980. No suitable habitat at PDR and MDR lots.
Coulter's goldfieds *Lasthenia glabrata* subspecies *coulteri*	--/--/1B	Coastal salt marshes and swamps, grassland, and vernal pools, often on alkaline soils.	**Low Potential.** Occurred at Ballona marshes at MDR in early 1900s; not observed in 1981. No suitable habitat at PDR and MDR lots.
Brand's phacelia *Phacelia stellaris*	--/--/1B	Open areas of coastal scrub and coastal sand dunes.	**Low Potential.** Historically occurred at PDR in the 1940s. No suitable habitat at PDR and MDR lots.
Ballona cinquefoil *Potentilla multijuga*	--/--/1A	Brackish meadows and seeps in Los Angeles County.	**Low Potential.** Occurred at Ballona marshes at MDR in late 1800s; possibly extirpated. No suitable habitat at PDR and MDR lots.
ANIMALS			
Invertebrates			
Belkin's dune tabanid fly *Brennania belkini*	--/*	Coastal sand dunes.	**Absent.** Known to occur at El Segundo Dunes in 1987 and PDR east of Vista Del Mar in 1980. Not observed during special-status invertebrate species surveys (Appendix B).
Busck's gall moth *Carolella busckana*	--/*	Coastal sand dunes.	**Absent.** Not observed during special-status invertebrate species surveys (Appendix B).
Tiger beetle *Cicindela gabbi*	--/*	Salt marshes.	**Absent.** Not observed during special-status invertebrate species surveys (Appendix B).

TABLE 4.C-1 (Continued)
POTENTIAL OCCURRENCE OF SPECIAL-STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR AND MDR LOTS

Common Name *Scientific Name*	**Status** FWS/CDFG/ CNPS	**General Habitat**	**Potential to Occur at PDR and MDR Lots**
		SPECIES ON OTHER LISTS (cont.)	
Invertebrates (cont.)			
Tiger beetle *Cicindela latesignata latesignata*	--/*	Salt marshes.	**Absent.** Not observed during special-status invertebrate species surveys (Appendix B).
Tiger beetle *Cicindela senilis frosti*	--/*	Salt marshes.	**Absent.** Not observed during special-status invertebrate species surveys (Appendix B).
Channel Islands dune beetle *Coelus pacificus*	--/--	Coastal sand dunes.	**Absent.** Not observed during special-status invertebrate species surveys (Appendix B).
Monarch butterfly *Danaus plexipus* (overwintering sites)	--/*	Dense, wind-protected tree groves (eucalyptus, Monterey pine, Monterey cypress) near the coast from northern Mendocino to Baja California.	**Moderate Potential.** Numerous observed in 1988, 1990, and December 1997 in dense eucalyptus grove on the south edge of Ballona wetlands. Potential temporary roosting site at PDR, Cluster 9. No roosting observed during ESA 2003 survey.
Henne's eucosman moth *Eucosma hennei*	--/*	Known to occur at El Segundo Dunes and Oso Flaco.	**Absent.** Reported to occur at El Segundo Dunes west of LAX airport in 1984. Not observed during special-status invertebrate species surveys (Appendix B).
Lange's El Segundo dune weevil *Onychobaris langei*	--/*	Coastal sand dunes, endemic at El Segundo dunes.	**Absent.** Historically occurred at El Segundo Dunes west of LAX airport in 1938. Not observed during special-status invertebrate species surveys (Appendix B).
Salt marsh skipper *Panoguina errans*	--/*	Coastal salt marsh - host plants include *spartina* species or *distichlis spicata*- flight season is June–September.	**Absent.** Reported at Ballona salt marsh. No suitable habitat at PDR and MDR lots. Not observed during special-status invertebrate species surveys (Appendix B).
Ford's sand dune moth *Psammobotys fordi*	--/--	Coastal sand dunes.	**Absent.** Not observed during special-status invertebrate species surveys (Appendix B).

TABLE 4.C-1 (Continued)
POTENTIAL OCCURRENCE OF SPECIAL-STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR AND MDR LOTS

Common Name *Scientific Name*	**Status** FWS/CDFG/ CNPS	**General Habitat**	**Potential to Occur at PDR and MDR Lots**
		SPECIES ON OTHER LISTS (cont.)	
Invertebrates (cont.)			
El Segundo flower-loving fly *Rhaphiomidas terminatu terminatus*	--/--	Coastal sand dunes.	**Absent.** Not observed during special-status invertebrate species surveys (Appendix B).
Dorothy's El Segundo dune weevil *Trigonoscuta dorothea*	--/*	Coastal sand dunes in Los Angeles County.	**Absent.** Reported at El Segundo Dunes west of LAX airport and south of Ballona Creek in 1980. Not observed during special-status invertebrate species surveys (Appendix B).
Mimic tryonia (=California brackish water snail) *Tryonia imitator*	--/*	Coastal lagoons and salt marshes from Sonoma County south to San Diego County.	**Low Potential.** Reported to occur along Ballona Creek in 1974. No suitable habitat at PDR and MDR lots.
Birds			
Great blue heron *Ardea herodias*	--/*	Usually nests in colonies in tops of secluded large snags or live trees, usually among the tallest available.	**Low to Moderate Potential.** Potential nesting habitat on most PDR lots. However, surrounding human disturbances may deter nesting.
Raptors (e.g., red-tailed hawk (*Buteo jamaicensis*))	--/3503.5	Large diameter trees in open groves or isolated trees	**Moderate Potential.** Potential habitat within trees on PDR lots, including, Clusters 2, 3, 4, 6, 8, 9, and 11.
		SENSITIVE HABITATS	
Southern coastal salt marsh	--/S2.1/--	Typically, *Frankenia* species, *Suaeda*, and/or *Salicornia subterminalis* occur along the upper landward edges of the marshes; *Salicornia bigelovii*, *S. virginica*, and *Batis maritima* at middle elevations; and *Spartina* closest to open water.	**Absent.** Occurs at mouth of Ballona Creek, between MDR on the north and Del Rey Bluffs on the south; creek diked and marsh does not get regular tidal flow.
Southern dune scrub	--/S1.1/--	Dominant species at El Segundo Dunes include *Ericameria ericoides, Lupinus chamissonis, Isomeris arobrea, Rhus integrifolia, Eriogonum parvifolium.*	**Absent.** El Segundo Dunes, west of LAX airport.

TABLE 4.C-1 (Continued)
POTENTIAL OCCURRENCE OF SPECIAL-STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR AND MDR LOTS

Status Codes:

Federal Categories (U.S. Fish and Wildlife Service)

FE = Listed as Endangered by the Federal Government
FT = Listed as Threatened by the Federal Government
FSC = Federal Species of Concern
FP = Federally proposed for listing

State Categories (California Department of Fish & Game)

CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California
CR = Listed as Rare by the State of California

California Native Plant Society (CNPS)

List 1A = Plants presumed extinct in California
List 1B = Plants rare, threatened, or endangered in California and elsewhere
List 2 = Plants rare, threatened, or endangered in California but more common
List 3 = Plants about which more information is needed
List 4 = Plants of limited distribution

S1.1 = Less than 6 Element Occurrences or less than 1,000 individuals or less than 2,000 acres; very threatened (State Ranking)
S2.1 = 6-20 Element Occurrences or 1,000-3,000 individuals or 2,000-10,000 acres; very threatened (State Ranking)
* = California Department of Fish and Game, Natural Diversity Database. January 2003. Special Animals List. Biannual publication, Mimeo.
Section 3503.5 = unlawful to take, possess, or destroy any raptors or owls or to take, possess, or destroy the nest or eggs of raptors or owls

-- = No listing status.

High Potential = Species expected to occur and meets all habitats as defined in list.
Moderate Potential = Habitat only marginally suitable, or considered suitable but not in species geographic range.
Low Potential = Habitat does not meet species requirements as currently understood in the scientific community.
Absent = Potential habitat present but presence / absence surveys determined that the species was not observed.

SOURCES: Arnold, 2003; CDFG, 2003; CDFG California Wildlife Habitat Relationship (WHR), 2003; CNPS, 2003; Chambers Group, 2000, ESA 2003.

Special-Status Plants

No suitable habitat is present for any special status plant species due to the disturbed nature of the sites, including urban landscaping and grading for well installation and abandonment, and presence of invasive plant species at the PDR and MDR lots. There are no wetlands present to support Ventura marsh milk-vetch, southern tarplant, Coulter's goldfields or Ballona cinquefoil. Although special status plant species that occupy coastal dune habitats have historically occurred within the project vicinity, these species (including San Fernando Valley spineflower, beach spectaclepod, Orcutt's pincushion, and Brand's phacelia) have low occurrence potential.

Special-Status Animals

Invertebrates

Several special-status invertebrate species are known to occur southwest of the PDR site near LAX (CDFG, 2003). Based on invertebrate surveys conducted at MDR and PDR, the MDR lot (Cluster 12) supports globose dune beetle on a small (approximately 400 square feet) degraded

central dune scrub habitat (Arnold, 2003), which occupies a small portion of the site. Globose dune beetle is a federal species of concern and it meets the definition of a rare species under CEQA (Section 15380, CEQA Guidelines). Although the site was substantially disturbed, globose dune beetle is presumed present at MDR. No other special-status invertebrate species were observed at MDR or PDR. No host plants (i.e., *Eriogonum parvifolium*) that support El Segundo butterfly, a federally endangered species, were observed at any of the sites (Arnold, 2003).

The nearest occurrence of monarch butterfly, a CDFG special concern species was reported on the south edge of the Ballona wetlands. In this area, numerous monarch butterflies were observed in 1988, 1990, and December 1997 in a dense eucalyptus grove (CDFG, 2003). Although the Samarkand site (Cluster 9) supports an abundance of eucalyptus trees, no monarch butterfly roosts were observed during surveys (ESA, 2003) (see Appendix C). The potential for monarch butterfly to use Cluster 9 as overwintering habitat is considered low. However, Cluster 9 may serve as a temporary aggregation site, primarily in the fall months (September–December), when monarch butterflies gather before moving on to a full-term roosting area.

Birds

Burrowing owl, a federal and state species of concern found throughout much of southern and central California has been observed within five miles of the area. This species often inhabits open areas with low-growing shrubs and has been observed in areas at the edge of cities. In March 2000 the Chambers Group conducted burrowing owl surveys equivalent to Phases I, II, and III of the protocol surveys developed by the Santa Cruz Predatory Bird Research Group (Chambers Group, 2000). The results of Chambers Group surveys in adjacent undisturbed areas indicated that small numbers of burrowing owls may inhabit “fringe” areas of sites along Calabar Avenue (near Clusters 10 and 11) and 79th Street (near Cluster 8). However, no burrowing owls or burrows were observed during the March 2000 site visit (Chambers Group, 2000).

Raptors (birds of prey), such as red-tailed hawk, are protected under the Migratory Bird Treaty Act and California Fish and Game Code Sections 3503 and 3503.5. Raptors have breeding potential in large diameter trees at most of the PDR lots, including but may not be limited to Clusters 2, 3, 4, 6, 8, 9, and 11. There is no potential nesting habitat for raptors at MDR. Additionally, other avian species, such as great blue heron, also protected under Section 3503 of the Fish and Game Code and the Migratory Bird Treaty Act, potentially nest in trees at most PDR lots.

Tree Inventory

In March 2000, the Chambers Group conducted an inventory of trees with a diameter at breast height (dbh) greater than 6 inches. The results are provided in Table 4.C-2. Results of the inventory indicated that Cluster 5 is the only cluster supporting an oak tree, which is protected by the City of Los Angeles. However, none of the lots proposed for sale are larger than one acre, therefore a permit is not required for removal of oak trees.

TABLE 4.C-2
TREE INVENTORY AT THE PDR AND MDR LOTS

Location (by Cluster Number)	Common Name	Scientific Name	Number of Trees Present (dbh >6 inches)
Playa Del Rey Lots			
Cluster 1	Fig	*Ficus* species*	1
	Blue elderberry	*Sambucus mexicana*	1
Cluster 2	Eucalyptus	*Eucalyptus globulus**	9
Cluster 3	Victorian box	*Pittosporum undulatum**	3
	Smooth Arizona cypress	*Cupressus glabra**	3
	Eucalyptus	*Eucalyptus globulus**	6
Cluster 4	Bishop pine	*Pinus muricata**	3
	California redwood	*Sequoia sempervirens**	4
	Leyland cypress	*Cupressocyparis leylandii**	4
Cluster 5	Fig	*Ficus* species*	2
	Canyon live oak	*Quercus chrysolepis*	1
	Maackia	*Maackia chinensis**	1
	Kangaroo thorn	*Acacia paradoxa**	5
	Palm	*Arecaceae*	3
Cluster 6	Bosnian pine	*Pinus leucodermis**	4
	Eucalyptus	*Eucalyptus globulus**	11
	Eastern red cedar	*Juniperus virginiana**	1
	Cypress	*Chamaecyparis* species*	7
	Elm	*Ulmus* species*	2
Cluster 7	Fig	*Ficus* species*	1
Cluster 8	Carrotwood	*Cupaniopsis anacardioides**	2
	Brazillian peppertree	*Schinus terebinthifolius**	1
	Eucalyptus	*Eucalyptus globulus**	12
Cluster 9	Eucalyptus	*Eucalyptus globulus**	23
Cluster 10	Benjamin fig	*Ficus Benjamina**	1
	Trochodendron	*Trochodendron araliodes**	1
Cluster 11	Eucalyptus	*Eucalyptus globulus**	3
Marina Del Rey Lot			
Cluster 12	--	--	0

* Indicates non-native to California or local area

SOURCE: Chambers Group, 2000

APPLICABLE REGULATIONS, PLANS, AND POLICIES

FEDERAL

Federal Endangered Species Act

The Federal Endangered Species Act of 1973 (FESA) and Title 16 (implementing regulations) of the United States Code of Regulations (CFR) 17.1 et seq., designate and provide for protection of threatened and endangered plants and animals and their critical habitat. Pursuant to the requirements of FESA, a federal agency reviewing a proposed project within its jurisdiction must determine whether any federally listed, threatened, or endangered species, or species proposed for federal listing may be present in the project area and determine whether the proposed project will have a potentially significant impact on such species. In addition, the federal agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3], [4]). Adverse project impacts on these species or their habitats would be considered potentially significant.

Procedures for addressing federal-listed species follow two principal pathways, both of which require consultation with the USFWS, which administers the Act for all terrestrial species. The first pathway (FESA, Section 10(a) Incidental Take Permit) is set up for situations where a non-federal government entity (or where no federal nexus exists) must resolve potential adverse impacts to species protected under the Act. The second pathway (FESA, Section 7 Consultation) and involves projects with a federal connection or requirement; typically these are projects where a federal lead agency is sponsoring or permitting the Proposed Project. For example, a permit from the U.S. Army Corp of Engineers (USACE) may be required if a project will result in wetland impacts. In these instances, the federal lead agency (e.g., the USACE) initiates and coordinates the following steps:

- Informal consultation with USFWS to establish a list of target species
- Preparation of biological assessment assessing potential for the project to adversely affect listed species
- Coordination between State and federal biological resource agencies to assess impacts/proposed mitigation
- Development of appropriate mitigation for all significant impacts on federally listed species.

The USFWS ultimately issues a final Biological Opinion on whether the project will affect the federally listed species. A Section 10(a) Endangered Species Incidental Take Permit may be necessary when the “taking” or harming of a species is incidental to the lawful operation of a project.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act implements international treaties between the United States and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the Fish and Game Code. Enforcement of the Act is carried out by USFWS law enforcement officials, while California Fish and Game Codes are enforced by CDFG game wardens.

California Endangered Species Act

Sections 2050 through 2098 of the California Fish and Game Code outline the protection provided to California's rare, endangered, and threatened species. Section 2080 of the California Fish and Game Code prohibits the taking of plants and animals listed under the authority of the California Endangered Species Act of 1984 (CESA). Individual animal species declared to be threatened or endangered by the California Fish and Game Commission are listed in Title 14 of the California Code of Regulations (CCR) under Section 670.5. In addition, the Native Plant Protection Act of 1977 (Fish and Game Code Section 1900 et seq.) gives the CDFG authority to designate State Endangered, Threatened, and Rare plants and provides specific protection measures for identified populations. Sensitive species that would qualify for listing but are not currently listed are afforded protection under CEQA. The CEQA Guidelines, Section 15065 ("Mandatory Findings of Significance") requires that a reduction in numbers of a rare or endangered species be considered a significant effect. CEQA Guidelines Section 15380 ("Rare or endangered species") provides for assessment of unlisted species as rare or endangered under CEQA if the species can be shown to meet the criteria for listing. Unlisted plant species on the California Native Plant Society's Lists 1A, 1B, and 2 would typically be considered under CEQA.

California Fish and Game Code

Sections 4700, 5050, and 5515 of the California Fish and Game Code outline protection for fully protected species of mammals, birds, reptiles and amphibians, and fish. Species that are fully protected by these Sections may not be taken or possessed at any time. The Department cannot issue permits or licenses that authorize the "take" of any fully protected species, except under certain circumstances such as scientific research and live capture and relocation of such species.

Specific Sections of the California Fish and Game Code pertinent to the current project include:

- Sections 1900 – 1913 (Native Plant Protection Act, which prohibits importing, taking, possessing or selling rare and endangered plants subject to several broad exceptions)
- Section 3503 (which prohibits the taking, possession, or needless destruction of the nest or eggs of any bird)

- Section 3503.5 (under which it is unlawful to take, possess, or destroy any raptors or owls or to take, possess, or destroy the nest or eggs of raptors or owls)
- Section 3513 (which prohibits the taking or possession of any migratory non-game bird as designated in the Migratory Act).

The CDFG has produced lists of special concern species that serve as watch lists. Species on these lists are either of limited distribution or the extent of their habitats has been reduced substantially such that threat to their populations may be imminent. These species may receive special attention during environmental review and may require mitigation under CEQA if impacts are substantial.

Birds of prey are protected by California Fish and Game Code Section 3503.5. Disturbance that causes nest abandonment or loss of reproductive effort is considered a taking by the CDFG. Construction disturbance during the breeding season can result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Any loss of fertile eggs or nesting raptors or any activities resulting in nest abandonment are considered a significant impact.

California Native Plant Society

The California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* provides a list of rare and vascular plants that may not be listed under CESA or FESA. Lists produced by CNPS are subject to extensive scientific review and are recognized as authoritative by botanists with the state and federal governments. Under CEQA, plants on List 1B can be treated as if they are state or federally listed. These species are categorized as follows:

- List 1A. Plants presumed extirpated in California
- List 1B. Plants that are rare, threatened, or endangered in California and elsewhere
- List 2. Plants that are rare, threatened, or endangered in California, but more numerous elsewhere
- List 3. Plants about which we need more information–a review list
- List 4. Plants of limited distribution–a watch list

LOCAL

Los Angeles County

Pursuant to the Protected Tree Ordinance (Title 22, Part 16, Section 22.56.2060), Los Angeles County requires an oak tree permit for any activity that involves cutting, destroying, removing, relocating, inflicting damage[2] or encroaching into a protected zone[3] of any tree of the oak genus

[2] "Damage" includes any act causing or tending to cause injury to the root system or other parts of a tree, including, but not limited to, burning, application of toxic substances, operation of equipment or machinery, or by paving, changing the natural grade, trenching or excavating within the protected zone of an oak tree.

that is: (a) 25 inches or more in circumference (eight inches in diameter) as measured four and one-half feet above mean natural grade; in the case of an oak with more than one trunk, whose combined circumference of any two trunks is at least 38 inches (12 inches in diameter) as measured 4.5 feet above mean natural grade, on any lot or parcel of land within the unincorporated area of Los Angeles County, or (b) any tree that has been provided as a replacement tree, pursuant to Section 22.56.2180, on any lot or parcel of land within the unincorporated area of Los Angeles County, unless an oak tree permit is first obtained.

Los Angeles County drafted an amended Protected Tree Ordinance (Title 22, Planning and Zoning of the Los Angeles County Code) on January 10, 2002. In addition to protecting oak trees, the proposed amendment would establish regulations to preserve California walnut and western sycamore, as well as modify encroachment exemptions. This proposed draft amendment has not been adopted (Starks, 2003).

City of Los Angeles

The following regulation is set forth in the Los Angeles Municipal Code, Chapter IV, Article 6, Section 46.02:

> No person shall relocate or remove any oak tree, as that term is defined in Section 46.01, where the said oak tree is located on a lot larger than one acre and is not regulated pursuant to Article 7 of Chapter I of this Code, without first having applied for and obtained a permit.

SIGNIFICANCE CRITERIA

To determine the level of significance of an identified impact, the criteria outlined in the CEQA *Guidelines* were used. The following is a discussion of the approaches to, and definitions of, significance of impacts to biological resources, drawn from several distinct CEQA *Guidelines* sections.

- CEQA *Guidelines* Section 15065 directs lead agencies to find that a project may have a significant effect on the environment if it has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory.

- CEQA *Guidelines* Section 15380 provides that a plant or animal species, even if not on one of the official lists, may be treated as “rare or endangered” if, for example, it is likely to become endangered in the foreseeable future.

- CEQA *Guidelines* Section 15382 (Significant Effect on the Environment) provides additional criteria to assess significant impacts on biological resources due to the proposed

[3] “Protected zone” shall mean that area within the dripline of an oak tree and extending there to a point at least 5 feet outside the dripline, or 15 feet from the trunks of a tree, whichever distance is greater (Protected Tree Ordinance 88-0157 Section 2, 1988, and 82-0168 Section 2, 1982).

project: "…a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance."

According to the CEQA *Guidelines*, the project would result in significant impacts to biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

ENVIRONMENTAL IMPACTS AND MITIGATION

Impact C.1: Future development at most PDR lots could result in harassment or mortality of species-status avian species. (Less than significant with recommended mitigation)

Special-status raptors and other avian species may nest in trees at or adjacent to future developments at PDR lots, such as Clusters 2, 3, 6, 8, 9, and 11. While the sale of the lots would not affect special-status avian species, subsequent development could result in direct harassment or mortality of raptor (such as red-tailed hawk) and other nesting avian species protected under the Migratory Bird Treaty Act and California Fish and Game Code Sections 3503 and/or 3503.5. Construction noise and tree removal activities could result in nest abandonment and/or mortality of young. Implementation of Mitigation Measure C.1 would reduce future impacts on special-status avian species to a less-than-significant level.

Recommended Mitigation Measure C.1: If construction activities, including tree removal, occur during the avian nesting season (March 1–August 15), surveys for raptors and other native nesting birds protected under the Migratory Bird Treaty Act and Sections 3503, 3503.5, 3511, and 3800 of the California Fish and Game Code shall be conducted by a

qualified biologist immediately prior to construction within 500 feet of the construction site (or a distance determined by the surveying biologist). If no adults or nests are observed within the construction area or within 500 feet of the project lots, then no further mitigation is required. If nests or paired adults are observed, one of the following two options shall be completed to reduce impacts on these species: (1) avoid the nesting area and related habitat by remaining at least 500 feet from raptor nests (other nesting birds require 250-foot buffer zone), or as determined by the surveying biologist (this distance may be modified in consultation with CDFG, depending upon site circumstances); or (2) avoid tree removal activities or construction until after the nesting season (August 15) or until after the young have fledged. (Recommended for Future Development)

Significance after Recommended Mitigation: Less than significant.

Impact C.2: Future development at PDR Cluster 9 could result in harassment or mortality of monarch butterfly, a CDFG special-concern species and a rare species under CEQA. (Less than significant with recommended mitigation)

The sale of the lot would not affect monarch butterfly. However, future development of PDR Cluster 9, which supports potential temporary aggregation habitat could result in direct harassment or mortality of monarch butterfly (primarily during the fall months) due to construction, including tree removal activities. Although no monarch butterflies were observed roosting or aggregating at Cluster 9, the species could potentially use the site in the future to gather before moving on to a full-term roosting area. Because the project site is outside the Coastal Zone and is not documented as a CDFG overwintering site, monarch butterfly does not meet the CDFG guidelines for protection. However, the species is considered rare under CEQA Guidelines Section 15380.

Because the type and location of future development is unknown, the following measure should be required prior to implementation of construction activities involving tree removal to reduce potential future impacts on monarch butterfly at Cluster 9 along with subsequent environmental review to analyze specific impacts on monarch butterfly and develop specific mitigation measures.

Recommended Mitigation Measure C.2: If construction activities, including tree removal occur during the monarch butterfly temporary aggregation season (September–December), presence/absence for overwintering monarch butterfly roosts shall be conducted by a qualified biologist immediately prior to construction. If no roosts are observed within the construction area of the project lots, then no further mitigation is required. If roosts are observed, then avoid tree removal activities (or construction activities if trees remain on site) shall be avoided until after the temporary aggregation season (September–December) or until monarch butterfly have moved from the site. (Recommended for Future Development)

Significance after Recommended Mitigation: Less than significant.

Impact C.3: Future development at MDR Cluster 12 could result in harassment or mortality of globose dune beetle, a federal species of concern and a rare species under CEQA. (Less than significant with recommended mitigation)

The sale of the lot would not affect globose dune beetle. However, future development of MDR Cluster 12 could have a substantial adverse effect on globose dune beetle, a federal special concern species and a rare species under CEQA. Future construction, including grading and coastal dune scrub removal activities, could result in direct harassment or mortality of globose dune beetle, primarily during the spring months.

Recommended Mitigation Measure C.3: Focused surveys for globose dune beetle shall be conducted by a qualified biologist during the appropriate identification season prior to construction at MDR Cluster 12. If no globose dune beetles are observed at MDR Cluster 12, then no further action would be required. If globose dune beetles are observed, the owner shall compensate for impacts to the beetle, assuming that the sale of the property would result in residential development and loss of habitat. Compensation shall be at a ratio of 1.5:1 (i.e., area compensated to area impacted) and could include: (1) contributing in-lieu funds to ongoing or new coastal dune scrub projects that promote establishment of globose dune beetle on lands preserved in perpetuity within Los Angeles County; or (2) enhancing or restoring coastal dune scrub habitat in perpetuity to promote establishment of globose dune beetle within suitable areas in Los Angeles County, which would include five-year annual restoration monitoring to determine the success of the restoration site. Performance standards for habitat restoration could include: (a) plantings, as a whole, exhibit at least 70 percent cumulative survival and have attained 75 percent cover at the restoration site at the end of the five-year monitoring period; or (b) no invasive non-native plant species within the restoration site. (Recommended for Future Development)

Significance after Recommended Mitigation: Less than significant.

CUMULATIVE IMPACTS

Impact C.4: Future development on the 36 lots proposed for sale, when combined with other foreseeable development in the area, could result in cumulative impacts with respect to biological resources. (Less than significant)

Cumulative projects within the larger Los Angeles County coastal region include those described in Section 3.6, located north of PDR and MDR. The sale of the Clusters would not contribute considerably to cumulative impacts on plants and animals in the larger Los Angeles County coastal region.

Assuming that the sale of the lots would result in future development and loss of habitat, implementation of mitigation measures described above would reduce substantial adverse effects

on these species. The potential loss of nesting, breeding, and foraging habitat for globose dune beetle, and potentially for monarch butterfly and avian species (e.g., red-tailed hawk, great blue heron) protected under the Migratory Bird Treaty Act and/or Sections 3503 and 3503.5 of the Fish and Game Code, would not contribute considerably to cumulative impacts on animals in the larger Los Angeles County coastal region. Although habitat for these species within the larger Los Angeles County coastal region has diminished over time, the project habitats provided at the lots proposed for sale are small, isolated, and already degraded. The Clusters are disturbed and/or landscaped with ornamental vegetation, lack native diversity of plant and wildlife, and provide limited habitat for special status animal species (mainly federal species of concern and those raptor and other avian species protected under Fish and Game Code Sections 3503 and 3503.5 and the Migratory Bird Treaty Act). None of the Clusters provide habitat for or support plants or animals protected by FESA or CESA.

Mitigation: None required.

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D. CULTURAL RESOURCES

ENVIRONMENTAL SETTING

PREHISTORIC CONTEXT

The coastal Southern California region contains an archaeological record that represents a wide array of cultural traditions spanning much of the Holocene Epoch (approximately 10,000 years ago to the present). The coastal landscape throughout the Southern California coast, especially during the early to mid-Holocene, featured lagoons, large estuaries, and bays harboring a rich community of life, such as mollusk, fish, and waterfowl. Wallace (1955) suggested four prehistoric periods for coastal Southern California, referred to as horizons, which emphasize the archaeological cultures and the relationships between them. These horizons, although highly simplified and generalized, are useful in that they reflect important changes in the material culture of prehistoric southern Californians. The four periods are briefly described below:

Horizon I. San Dieguito Horizon, is the earliest period, with sites distributed in San Diego County, the Colorado Desert, and northward along the California coast. This horizon dates between 8,500 before present (BP) and 9,000 BP. The San Dieguito deposits are characterized by a lack of grinding implements and suggest that cultures that exploitated marine and littoral resources existed locally prior to 7,000 years ago.

Horizon II. The next period, often referred to as the Millingstone Horizon or Encinitas Tradition, occurred from about 8,000 BP to 3,000 BP. Periodic climatic changes may have driven the cultural changes marking the onset of Horizon II. Increased dependence on plant foods is reflected by the frequent presence of seed processing tools, manos, and metates. Projectile points are rare and usually suggest use of the atlatl (spear thrower). The technological and economic focus that represented this horizon proved to be a stable strategy that lasted roughly 5,000 years.

Horizon III. The third prehistoric period, known as the Intermediate Horizon, was relatively well developed in the Orange County area. Horizon III is characterized by the introduction of small projectile points, suggesting increased hunting and the advent of the bow and arrow. True maritime exploitation and occupation of the Channel Islands began during this period. Horizon III dates roughly from 3,000 to 1,000 years BP.

Horizon IV. The final prehistoric horizon began about 1,000 BP and ended with the arrival of Europeans. In Orange County, the prehistoric period ended with the overland expedition of Portola in 1769. Horizon IV is marked by large increases in population, greater production of art work, and permanently occupied villages. The period from 1000 BC to AD 750 is known as the Intermediate Horizon (Chambers, 2000). During this horizon, mortars and pestles appeared, indicating the beginning of acorn exploitation. Use of the acorn, a high-calorie, storable food source, probably allowed greater sedentism and a higher level of social organization. Large projectile points indicate that the bow and arrow, a hallmark of Horizon IV, had not yet been

introduced, and hunting was likely accomplished using the atlatl. Settlement patterns during this time are not well understood. The semisedentary settlement pattern characteristic of Horizon IV may have begun during the Intermediate Horizon, although lower population densities may have limited local territoriality.

BALLONA WETLANDS PREHISTORY

Recent studies of landscape evolution in the Ballona Wetlands area of Southern California have revealed more detailed settlement information unique to the Westchester Bluffs. Homburg et al. (2001) conducted a geoarchaeological analysis though extensive augering to reconstruct the succession of landforms and their effect on human occupation. Three distinct cultural adaptations were identified as they relate to a particular stage of landscape and lagoonal development over the last 7,000 years:

- Early Period (7,000–3,000 BP) marked by short-term, bluff-top occupations overlooking a shallow bay or lagoon
- Middle Period (3,000–1,000 BP), characterized by an influx of population distributed on bluff-top and creek-edge settings
- Late Period (1,000–200 BP), marked by population aggregation around the lagoon

Estuarine conditions prevailed at the present-day Ballona Wetlands until lagoon development began, around 6,200 BP; at that time the lagoon began to slowly fill with alluvium, until around 2,000 BP. As a result, human settlement tended to move westward through time; initial occupation began on the Baldwin Hills, shifted in the Middle Period to the Westchester Bluffs, and ended with large settlements at the mouth of Centinela Creek and the Ballona Lagoon (Homburg et al., 2001).

HISTORIC SETTING

Although the Spanish inaugurated their system of missions in Alta California in 1769, the first Spanish explorers in this region visited the coastline much earlier (Chambers, 2000). Juan Rodriguez Cabrillo arrived in 1542, followed by Pedro de Unamuno in 1587, Sebastian Rodriguez Cermeño in 1595, and Sebastian Vizcaíno in 1602. After Vizcaíno's visit, 167 years passed before Europeans again explored the Alta California coastline; the first mission, at San Diego, was founded on the heels of the Gaspar de Portolá land expedition in 1769 (Chambers, 2000). Native American inhabitants of the Los Angeles Basin were taken to Mission San Gabriel, constructed in 1771 (Chambers, 2000), and were called Gabrielinos by the Spanish because of their association with the mission.

The Spanish government made several large land grants in the Los Angeles Basin, but much of the land was not granted until Mexico gained independence in 1822 and the mission holdings were secularized in 1834. The current project area is located near the historic boundary between two Mexican ranchos: the 22,459-acre Sausal Redondo grant of 1837, and the 13,920-acre

Ballona grant of 1839 (Chambers, 2000). The Ballona rancho may have carried over from an earlier Spanish grant (Chambers, 2000), with the name derived from the claimants' home city of Bayona in northern Spain (Chambers, 2000). The smaller 2,219-acre Aguaje de la Centinela grant of 1844 (Chambers, 2000) was situated just east of the project area.

During the Mexican administration of Alta California, the early pueblo of Los Angeles was located in the area west of the present-day Union Station downtown (Chambers, 2000). The rest of the surrounding lands were divided into ranchos largely devoted to livestock and cultivation. California became an American state in 1850, but the population of Southern California remained relatively low through the 1860s and 1870s, with cattle ranching continuing as the principal economic activity. However, a period of drought and expensive land title defense cases in U.S. courts resulted in the sale of many of the cattle ranches to Anglo-Americans.

Immigration to Southern California increased substantially after Los Angeles was connected by the Southern Pacific Railroad to the transcontinental Central Pacific Railroad in San Francisco in 1876 (Chambers, 2000). The Southern Pacific Railroad completed its own transcontinental connection from Los Angeles through Yuma in 1881 (Chambers, 2000). During the 1880s, towns were hastily formed and land was sold by real estate developers to new arrivals from the east. Land speculation escalated as the second transcontinental railroad, the Atchison, Topeka, and Santa Fe, reached Los Angeles in 1886. The two railroads vied for customers by waging a fare war, encouraging many people to move to Southern California.

The original Ballona Lagoon (now MDR) was proposed several times as the location of a commercial port facility for Los Angeles (Chambers, 2000). With backing from the Santa Fe Railroad, Moses L. Wickes made the first proposal in 1886, investing $300,000 in the "La Ballona" project (Chambers, August 2000). The attempt failed, but the idea was revived under the name Playa del Rey (PDR) in 1902 (Chambers, 2000). The U.S. Army Corps of Engineers studied the lagoon in 1916, but concluded that its development as a commercial harbor was not feasible. The Los Angeles County Board of Supervisors commissioned another study in 1936, but later decided to concentrate all commercial port facilities at Los Angeles and Long Beach Harbors. During the late 1940s, the Corps of Engineers initiated a feasibility study for a recreational boat harbor at the lagoon. The MDR harbor and channel were created by dredging the lagoon, but the marina and associated breakwater were not completed until 1965 (Chambers, 2000).

The first producing well in the PDR gas storage field was completed in 1929. By 1930, the field contained 141 producing wells. During 1934 and 1935, 50 additional wells were drilled in the Del Rey Hills area. During World War II, the federal government assumed control of the field. The Southern California Gas (SCG) Company acquired the field in 1953 as surplus government property; however, SCG began operations at the field in 1942 (Chambers, 2000). Since that time, parcels not occupied by gas wells have been developed as residential properties.

Three historic resources located within one mile of the MDR portion of the project area are listed on the National Register of Historic Places, including the Venice Canal Historic District, Warren Wilson Beach House, and American Trona Corporation building (Chambers, 2000). All three are located north of and beyond the project area and would not be affected by the proposed sale. The Venice Canals were created in 1905 as part of a unique residential subdivision. The Venice Canal System is also listed as City of Los Angeles Historic-Cultural Monument No. 270. The Warren Wilson Beach House is also located in Venice. The American Trona building was constructed in 1916 as a storage facility for raw salt.

Twelve additional historic resources are located within one mile of the overall project area, including a streetcar depot and 11 residential structures (Chambers, 2000). None of these resources have been listed on the National Register of Historic Places. None occur within the boundaries of the project area.

There are no California Historical Landmarks or California Points of Historical Interest listed within a one-mile radius of the project area (Chambers, 2000). One of the prehistoric archaeological sites located within a one-mile radius of the project area, CA-LAN-47, is also listed as City of Los Angeles Historic-Cultural Monument No. 490, the site of the Gabrielino village of Sa-Angna.

ETHNOGRAPHIC CONTEXT

The project area is located within territory that was occupied by the Gabrielino Native American group when Europeans first arrived in the region (Bean & Smith, 1978). Gabrielino settlement and subsistence patterns may extend back to the beginning Horizon IV, about AD 750. The Gabrielino were semi-sedentary hunters and gatherers.

Coastal groups collected shellfish and fished for estuary, nearshore, and kelp-bed species. Dried fish and shellfish were exchanged for inland products such as acorns. The nuts were pounded into flour using stone mortars and pestles and then cooked as soup or gruel. Seeds from sage, grasses, goosefoot, and buckwheat were ground with stone manos and metates. Deer, rabbits, birds, and marine mammals were hunted using the bow and arrow, nets, traps, and snares.

The Gabrielino lived in villages of up to 200 people near permanent water sources and a variety of food resources (Bean & Smith, 1978). The village acted as the center of a territory from which resources were gathered. Small groups left the village for short periods to hunt, fish, and gather plant foods, as well as collect raw materials for tools, housing, and other utilitarian needs. While away from the village, they established temporary camps and resource processing locations (Chambers, 2000). Archaeologically, such locations are marked by bedrock mortars for acorn processing, manos and metates for seed grinding, and flaked lithic scatters indicating the manufacturing or maintenance of stone tools (usually of chert) used in hunting or butchering. Overnight stays in these field camps are indicated by fire-affected rock resulting from use in hearths (Chambers, 2000).

ARCHIVAL METHODS

A records search of pertinent survey and site data was conducted at the South Central Coastal Information Center, Fullerton, California. The records were accessed using the Venice, California U.S. Geological Survey (USGS) 7.5-minute quadrangle map, unsectioned, Township 2S, Range 15W. The review included the PDR and MDR sites along with a one-quarter-mile buffer that constituted the project area. Previous surveys, studies, and archaeological site records were accessed as they pertained to the project area. Properties within the project area listed in the National Register of Historic Places, the California Register of Historic Resources, the California Inventory of Historic Resources (1976), the California Historical Landmarks (1996), and the California Points of Historical Interest (1992) were searched.

ARCHIVAL FINDINGS

Twenty-eight archaeological sites have been recorded within a one-mile radius of the project area. Of these, 23 are prehistoric archaeological sites and six are historic archaeological sites.

Six prehistoric sites are located within the boundaries of the PDR portion of the project area: CA-LAN-63, CA-LAN-64, CA-LAN-65, CA-LAN-203, CA-LAN-204, and CA-LAN-206. These sites are summarized below in **Table 4.D-1**. All six sites are situated in the northern half of this portion of the project area, between Gulana Avenue on the west and Hastings Avenue on the east, placing some of these known site locations within a quarter-mile of the 36 lots proposed for sale. None of the known sites were identified within the footprints of the lots. This area is located on top of the bluff that overlooks the Ballona Creek drainage to the north, which would have served as an optimal location for exploiting Ballona Creek wetland resources. The locations of the 36 lots were compared with the mapped locations of these prehistoric sites, and none of the parcels are within the boundaries of the prehistoric sites. These sites have been largely destroyed as a result of bluff erosion and housing development. Thus, the sale and future development of these parcels would not result in adverse impacts on any of these known resources. However, previously unrecorded subsurface archaeological resources could be present within the individual parcels.

No archaeological sites have been recorded within the MDR portion of the project area. Prehistoric archaeological sites are not expected within the former Ballona Lagoon and wetlands, which were dredged and filled in 1965 to form the marina.

NATIVE AMERICAN CONSULTATION

The Native American Heritage Commission (NAHC) was contacted on October 10, 2003 in order to request a database search for sacred lands or other cultural properties of significance to local Native Americans. The sacred lands survey failed to indicate the presence of cultural resources in the project area. The NAHC provided a list of Native American contacts that may have further knowledge of the project area with respect to cultural resources and potential impacts to those resources that could occur as a result of the proposed sale. Each person or organization listed on

TABLE 4.D-1
PREHISTORIC ARCHAEOLOGICAL SITES RECORDED WITHIN THE PLAYA DEL REY PORTION OF THE PROJECT AREA

Trinomial Site Designation	Initially Recorded	Site Type	Site Description
CA-LAN-63	6/5/50	Village site	Ground stone artifacts; midden soils
CA-LAN-64	6/5/50	Habitation site	Ground and flaked stone artifacts and shell
CA-LAN-65	6/5/50	Habitation site	Ground and flaked stone artifacts and shell
CA-LAN-203	6/5/53	Seed processing site	Ground stone artifacts (metates)
CA-LAN-204	6/5/53	Not defined	None available
CA-LAN-206	6/5/53	Seed processing site	Ground stone artifacts (manos, metates, and cogstones)

SOURCE: South Central Coastal Information Center, California State University Fullerton, California.

the NAHC list was contacted by letter requesting information about locations of importance to Native Americans. No responses have been received as of the writing of this document. If, as planning proceeds, further information or concerns relevant to the project are presented from a NAHC contact, further consultation between the lead agency and the contact is recommended.

SURVEY METHODS AND FINDINGS

The surface of each lot was examined by ESA's archaeologist for constituents of archaeological sites, such as artifacts, features or facilities, and/or culturally modified soil horizons. Due to the extensive built setting and landscape cover, visibility of the native surface was minimal to zero. No archaeological materials were identified during this survey.

Because the project is to be located within built environments, the utility of pedestrian archaeological survey methods is diminished due to the lack of native soil and topographic visibility. Moreover, much of PDR and MDR has been subjected to landfill, which has obscured the visibility of the native surface. Archaeological sites can consist of extensive subsurface components that would be difficult to localize without test excavations. Under such circumstances, construction monitoring by qualified archaeological monitors may be substituted for survey, evaluation/testing, or data recovery.

With respect to historic resources, the nature of the proposed sale—that is, the sale of the lots themselves—would not directly or indirectly impact structures or properties. The residences that are adjacent to the lots are modern—that is, less than fifty years old—and do not possess

elements that would constitute eligibility for historical significance. Consequently, no impact to built historical resources for the proposed sale is expected. Nevertheless, this does not preclude the existence of subsurface historical resources in the project area.

PALEONTOLOGICAL RESOURCES

The top of the bluff within the PDR portion of the project area is underlain by late Quaternary dune sand (unit Qs), while the slope at the northern margin of the project area is underlain by the marine Palos Verdes Sand, which stratigraphically underlies the dune sand (Chambers, 2000). The archives of the Natural History Museum of Los Angeles County Vertebrate Paleontology Section indicate that no fossils have been reported from the dune sand anywhere within the USGS Venice 7.5-minute quadrangle. Moreover, no vertebrate fossil sites have been reported in the dune sand (Chambers, 2000). The lack of any previously recorded fossil sites suggests that the potential is low for late Pleistocene fossil remains to occur in the project area where underlain by dune sand.

However, several previously recorded fossil sites do occur in the Palos Verdes Sand, including Natural History Museum of Los Angeles County Vertebrate Paleontology Section fossil site 1024, Invertebrate Paleontology Section fossil site 59, and others, which occur immediately east of the project area along the western side of Lincoln Avenue (Chambers, 2000). These fossil sites yielded the fossilized remains of 300 species of late Pleistocene (Ice Age) shallow-water marine invertebrates, including snails and clams; the fossilized bones and teeth of marine vertebrate species, including fishes, sharks, seals, and porpoises; the fossilized bones of birds; and the fossilized bones of a land mammal species (gopher). These fossil occurrences indicate that the potential is high for late Pleistocene fossil remains to occur along the northern margin of the PDR portion of the project area where underlain by the Palos Verdes Sand.

By contrast, little or no potential for such fossils is indicated by the geological character of the MDR portion of the project area, which is comprised of dune sand and fill materials dredged from Ballona Lagoon during construction of the marina.

HUMAN REMAINS

No verifiable evidence exists to conclusively demonstrate that human remains do not exist on the SCG parcels. However, given the history of development in the area and the lack of burial sites recorded in the vicinity, the presence of human remains is unlikely.

HISTORICAL SIGNIFICANCE (AS DEFINED IN CEQA GUIDELINES SECTION 15064.5)

No areas of historical significance are known to exist on the 36 lots proposed for sale.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

The *Westchester-Playa del Rey Plan*, which is part of the *General Plan of the City of Los Angeles*, contains the following provision under Cultural Heritage Resources (City of Los Angeles, 1974):

- Review potential resource impacts through the County and City's Environmental Guidelines and require appropriate environmental documentation and reasonable mitigation measures as determined by the Department of City Planning and the State Historic Preservation Office.

SIGNIFICANCE CRITERIA

Based on Section 15064.5 and Appendix G of the CEQA Guidelines, a project would have significant adverse impacts to cultural resources if the project would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5;
- Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

CEQA Guidelines 15064.5 provides that, in general, a resource not listed on state or local register of historical resources shall be considered by the lead agency to be historically significant if the resource meets the criteria for listing on the California Register of Historical Resources. This section also provides standards for determining what constitutes a "substantial adverse change" that must be considered a significant impact on archaeological or historic resources.

According to the CEQA Guidelines 15064.5(a)(3), a resource shall generally be considered "historically significant" if the resource meets the criteria for listing on the California Register of Historic Resources (Public Resources Code Section 5024.1, California Code of Regulations, Section 4852). When a project would affect an archeological site, it must be determined whether the site is a historical resource, which is defined as any site which:

(a) Is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, or cultural annals of California; and

(b) Meets any of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, a resource included in a local register of historical resources, as defined by Public Resources Code Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.l(g), shall be presumed to be historically or culturally significant.

CEQA also requires lead agencies to consider whether projects would affect "unique archaeological resources." Public Resources Code Section 21083.2(g), states that 'unique archaeological resource' means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized important prehistoric or historic event or person."

ENVIRONMENTAL IMPACTS AND MITIGATION

Impact D.1: Future development of the lots could cause substantial adverse changes to the significance of currently unknown cultural resources. (Less than significant with recommended mitigation)

Although the present survey and previously conducted surveys did not reveal new cultural resources at the proposed lots, these surveys may not conclusively demonstrate the nonexistence of subsurface cultural resources on the project site. Traditional foot survey methods are constrained due to variation in the natural landscape, such as grass cover and grazing that can obscure surface evidence. Moreover, the Westchester bluffs and the surrounding area have experienced a long period of human occupation and landscape change. Significant artifactual, ecofactual (i.e., plant and animal remains), and geofactual (i.e., soils, sediments, and minerals) evidence of this occupation can be revealed whenever subsurface activity takes place. If historical resources, unique archaeological resources, or traditional cultural properties do exist on the project site, grading and other construction-related activities could cause significant impacts to the scientific value of those resources.

Recommended Mitigation Measure D.1: Pursuant to CEQA Guidelines 15064.5(f), provisions for historical or unique archaeological resources accidentally discovered during construction shall be instituted. In the event that prehistoric or historic subsurface cultural resources are discovered during ground-disturbing activities, all work within 50 feet of the

resources shall be halted and the City shall consult with a qualified archaeologist or paleontologist to assess the significance of the find. If any find is determined to be significant, representatives of the City and the qualified archaeologist and/or paleontologist shall meet to determine the appropriate avoidance measures or other appropriate mitigation. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards. (Recommended for future development)

If the discovery includes human remains, CEQA Guidelines 15064.5 (e)(1) shall be followed, which includes:

(e) In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps shall be taken:

(1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

(A) The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required, and

(B) If the coroner determines the remains to be Native American:

1. The coroner shall contact the Native American Heritage Commission within 24 hours.

2. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.

3. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or

(2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

(A) The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.

(B) The descendant identified fails to make a recommendation; or

(C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native

American Heritage Commission fails to provide measures acceptable to the landowner.

Significance after Recommended Mitigation: Less than significant.

Impact D.2: Future development could damage or degrade unidentified paleontological remains. (Less than significant with recommended mitigation)

As mentioned above, the geological character of the MDR portion of the project area is comprised of dune sand and fill materials dredged from Ballona Lagoon during construction of the marina. Consequently, the fossil-bearing potential of the area is substantially reduced. This notwithstanding, significant fossil discoveries can be made even in areas designated as having low potential and could result from the excavation activities related to the proposed project. This impact would be reduced to a less-than-significant level with the incorporation of Recommended Mitigation Measure D.2.

Recommended Mitigation Measure D.2: The project proponent shall notify a qualified paleontologist of unanticipated discoveries and subsequently document the discovery as needed. In the event of an unanticipated discovery of a breas, true, and/or trace fossil during construction, excavations within 100 feet of the find shall be temporarily halted or diverted until the discovery is examined by a qualified paleontologist. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find. (Recommended for Future Development)

Significance after Recommended Mitigation: Less than significant.

CUMULATIVE IMPACTS

Impact D.3: Future development on the 36 lots proposed for sale, when combined with other foreseeable development in the vicinity, could result in cumulative impacts with respect to cultural resources. (Less than significant)

Because the proposed sale would not affect known significant archaeological resources, it would not be likely to cause significant cumulative impacts. Moreover, the combined effects of the implementation of both county and state level regulations that require identification and evaluation of cultural resources as part of environmental review effectively reduces the cumulative impacts that would occur to cultural resources. Because this uniform policy is designed in each case to reduce impacts on cultural resources to below a level of significance on a site-specific basis, cumulative impacts would be less than significant

Therefore, no cumulative impacts related to cultural resources would occur as a result of future development of the 36 lots proposed for sale.

Mitigation: None required.

REFERENCES – Cultural Resources

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Homburg, J.A., et al., *Evolving Holocene Landscapes and Cultural Land-Use Patterns in the Ballona Wetlands of Coastal Southern California.* Poster presented at Society of American Archaeology Conference, 2001.

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E. GEOLOGY AND SOILS

ENVIRONMENTAL SETTING

The project area is approximately four miles south of the city of Santa Monica, 1.5 miles north of the Los Angeles International Airport, five miles west of Culver City, and is bordered by Santa Monica Bay to the west. PDR is located within the city of Los Angeles, and MDR is within the county of Los Angeles. MDR is approximately two miles northwest of PDR, separated by the Ballona Wetlands and the MDR Channel.

Numerous consultants have conducted geological, geotechnical, and geophysical assessments at the project sites to evaluate the potential for migration of petroleum gases associated with the underlying oil bearing formations and the PDR Gas Storage Facility. This EIR analysis included review of reports prepared by Camp Dresser and McKee (CDM), Exploration Technologies, Inc. (ETI), Earth Consultants International (ECI), R.L. Hester, Davis and Namson Consulting Geologists, the U.S. Department of the Interior Minerals Management Service (United States Oil and Gas Resources Assessment of the Pacific Outer Continental Shelf Region), and the California Department of Water Resources (DWR) Bulletin 118 and Bulletin 104. The complete references for these sources are provided at the end of this section.

GEOLOGIC SETTING

Surface geologic features include the Playa del Rey Bluff, a prominent topographic feature in the project area, located five miles south of the Santa Monica Mountains and about five miles north of Palos Verdes Peninsula hills to the south. The Playa del Rey Bluff is a westerly extension of the Baldwin Hills and Fox Hills located 3 miles to the east and represents the southern flank of the ancestral Los Angeles River (now Ballona Creek) valley, which formerly flowed through this area. Geologically, the Los Angeles basin is a deep, sediment-filled structural depression with recent sedimentary deposits overlying older sedimentary rocks (i.e. sandstone). Beneath the sedimentary rocks are older crystalline basement rocks, consisting of schists (shales that are altered by heat and pressure).

Tectonic forces (those related to faults and earthquakes) beneath the earth uplifted, tilted, and folded the sedimentary rocks. These tectonic forces along both surface faults (e.g., the Newport-Inglewood and related faults) and buried (so-called “blind”) thrust faults (e.g., Torrance-Wilmington, Elysian Park-Puente Hills, Las Cienegas-Coyote Hills, Los Angeles Basin, and Compton-Los Alamitos) formed the chain of hills extending northwest-southeast from north of Los Angeles to Long Beach.

Many subsurface geologic features within the Los Angeles Basin, such as depositional sequences and folds and faults in the rocks, produced geological structures that trapped and accumulated oil and gas, resulting in numerous oil and gas fields. The PDR gas field underlies most of the PDR and MDR area. Initially, this field was the site for oil development and then later, gas storage in this western location of the Los Angeles metropolitan region.

GEOLOGIC UNITS

Geologically recent river and floodplain deposits cover the MDR area, which is north of the Ballona escarpment, (a cliff formed by erosion) while south of the escarpment in PDR, older sand dunes are present as surface deposits. Underlying the surface deposits is a series of geologic units that extend thousands of feet below the project area and are not exposed at the surface. The commercial oil or gas producing zones and the PDR Gas Storage Facility are located within the deeper geologic formations. Geologic hazards, if any, on a particular lot could be attributed to near surface geologic materials such as the surface soils and the younger deposits immediately below the surface soils. Deeper geologic units and structures could influence seismic hazards depending on the geologic structure and underlying faults or the behavior of upward migration of subsurface gases, if it was to occur. **Table 4.E-1** presents the geologic column that lies beneath the project area (from geologically youngest to oldest) and briefly describes each unit and its relationship and relevance to potential impacts in the project area.

STRUCTURE AND SEISMICITY

Compression between the North American and Pacific plates creates tectonic forces that shape many of the surface features we see today. When forces along the plate boundary increase to the point of failure, earthquakes occur and often times, the displacement experienced deep in the earth where the failure occurs translates at the surface as surface fault rupture. Several active and potentially active faults are located within the project vicinity.[1] Regional tectonic stresses also uplifted, tilted, and folded sedimentary rock units in the project area, creating hills and related geologic structures. Geologic structures underlying many hills are often elongated domes or anticlines, similar to those underlying Fox Hills and Baldwin Hills. In the PDR project area, the thick sedimentary rock layers are gently folded into a broad anticline (elongated dome or convex upward folded geologic structure). Along with stratigraphic (depositional) confinement, the anticline forms a structural trap for oil and gas accumulation within the PDR oil field.

Faulting

Faults are fractures or lines of weakness in the earth's crust. Faults that allow landmasses to move horizontally past each other are strike-slip faults (e.g., San Andreas, San Jacinto, Elsinore, and Newport-Inglewood). In contrast, vertical movement occurs along thrust faults. Buried low angle thrust faults that do not rupture the surface are known as blind thrust faults. Earthquake research over the last decade has demonstrated that a complex array of buried, thrust faults underlie the Los Angeles area. Notable thrust fault systems include the Elysian Park Thrust Fault (also known as the Elysian Park Fold and Thrust Fault, the Elysian Park blind thrust fault) and Torrance-Wilmington Fold and Thrust Belt. Blind thrust faults generated the 1987 magnitude 5.9

[1] An "active" fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years). A "potentially active" fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive

TABLE 4.E-1
GEOLOGIC UNITS UNDERLYING THE PDR AND MDR PROJECT AREA
(Listed geologically youngest to oldest)

Geologic Unit Name	Geologic Description	Location and Proximity to Project Lots	Relevance to Project Lots
Surface Soils	Only disturbed, semi-natural soils remain in the project area with limited depths. Consist of clay sand and silt mixtures.	Disturbed and semi natural soils occur on the surface of MDR and PDR project lots	Due to the past development, original soil resources are disturbed. Most, if not all project lots are not overlain by intact, native soil profiles.
Recent Alluvium	Recent river and floodplain alluvium and near-shore deposits consisting of gravels, sand, silt, and clay.	Recent alluvium underlies surface materials in the MDR.	The primary exposed material, other than soil, on MDR project lots. Could be attributable to geologic and seismic hazards. Include deposits that are known locally as the "50-Foot Gravel"[1]
Older Dune Sand	Older dune sand deposits cover ancient marine terraces and consist of sand, although also contain silt, clay, and gravel lenses.	Older sand dunes underlie the surface materials in the PDR project area.	Primary geologic unit exposed on the 34 PDR lots other than soil and could be the cause of geologic and seismic hazards.
Lakewood Formation	Approximately 100-feet thick and consists of sand, silt, and gravel.	Not exposed at surface but underlies the Bluffs area of PDR.	No direct influence on potential geologic and seismic hazards on the lots.
San Pedro Formation	Consists of sand deposits with lenses of gravel, silt, and clay.	Not exposed at surface. 50 feet deep in the MDR area and 150 feet deep in the PDR area.	Intermediate geologic unit. No direct influence on potential geologic and seismic hazards on the lots.
Pico Formation	Marine sandstone, siltstone, and shale, interbedded with marine gravels (DWR, 1961)	Occurs at a depth of about 400 to 500 feet below the surface in the project area	Shale units form impervious caps or barriers to upward movement of water, oil, and gas, trapping the hydrocarbon below.
Repetto Formation	Siltstone and shale with layers of sandstone and conglomerate.	Approximately 3,000 feet below the surface.	Sandstone beds within the upper and middle Repetto Formation form the upper oil producing zone found in the MDR area (Davis, 2000).
Puente Formation	Shale devoid of major sand-bearing units.	Underlies MDR and PDR at depths generally over 5,000 feet	The thick shale interval is impermeable and forms the primary cap or seal for the PDR oil field and the gas storage zone (Davis, 2000)
The Topanga Formation	Comprised of sandstone and conglomerate weathered material from the underlying Catalina Schist.	Does not underlie the entire project area. Depth is about 6,000 feet.	The schist conglomerate is the primary reservoir for the PDR oil field and the gas storage zone.
Santa Monica Schist or Catalina Schist	Basement rock at depths greater than 6,000 feet	Underlying the project area and most of the Los Angeles Basin	No direct influence on geology or geologic Hazards on lots.

[1] The "50-foot gravel" was thought to provide preferential pathways for subsurface gas migration to the surface. The total thickness of recent alluvium varies from several feet to about 60 feet. According to a subsurface investigation conducted for this EIR, the Ballona Aquifer does not underlie the project sites (Brown and Caldwell, 2004)

Whittier Narrows earthquake and the 1994 magnitude 6.7 Northridge earthquake. Because of these recent events, blind thrusts are considered a future earthquake risk, especially in the Los Angeles basin. In the PDR project area, the Compton blind thrust fault is about 20,000 to 30,000 feet below the site; well below the gas storage zone. Faults that exhibit both vertical and horizontal movement are known as oblique faults (e.g., Santa Monica-Hollywood, Cucamonga, Palos Verdes, and Raymond Faults and Fault Zones). Other faults defined within a 5 mile radius of the site include the northwesterly-trending Newport-Inglewood, Palos Verdes, Overland Avenue, and Charnock faults. Major fault zones in Southern California within approximately 25 miles of the site are summarized in **Table 4.E-2**.

Within the PDR Gas Storage Facility area and the Storage Zone Area of Influence (within one mile of the main facility), investigators Metzner (1935), Hodges (1944), and Riegle (1953) interpreted two sets of minor faults that appeared to displace Catalina Schist and Topanga Formation schist conglomerate at depths greater than 4,000 ft below ground surface (Davis, 2000a). Subsequent analysis by Hester (1986) and Davis (2000) did not find conclusive evidence for the existence of these minor faults and the studies determined that if the faults did exist, they are short, minor offsets at depths greater than 4,000 feet that have probably not experienced displacement within the last 14 million years and certainly not in the last 3 to 4 million years (Davis, 2000a)[2].

The Charnock fault, the nearest fault in the project vicinity, is located about 1.5 miles east of the PDR and MDR area and extends southeast from near Venice Boulevard toward the City of Gardena. The Charnock fault displaces lower aquifers acting as a partial barrier to groundwater movement (DWR, 1961). This fault was thought to be a six-mile long vertical thrust with the northeast side downthrown relative to the southwest side. The Los Angeles County Seismic Element (1990, Plate 1) and the California state fault map (Jennings, 1995) classifies the Charnock fault as a potentially active fault. However, detailed 3-dimensional seismic survey data revealed no evidence of the Charnock fault in the vicinity of the PDR and MDR project area (Davis, 200b).

The Lincoln Boulevard Fault, initially proposed by ETI (2000) to explain the presence of methane gas found during soil-gas surveys at the project sites, was thought to be located east of and parallel to Lincoln Boulevard (ETI, 2000). Subsequent seismic studies conducted by ETI (2000), ECI (2000), and Davis (2000) evaluated the potential for faulting near the intersection of Lincoln and Jefferson Boulevards at the Playa Vista site. These studies, that included subsurface drilling and seismic surveys, did not find evidence of the Lincoln Boulevard fault and could not confirm the presence of local faulting. The postulated Lincoln Boulevard fault is inconsistent with the existing geophysical and geologic data from the Playa Vista area (Davis, 2000b).

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2 Davis (2000) used five different geologic and geophysical methods to evaluate the possibility of faulting beneath the Playa Vista Site. These included geologic data review, construction of subsurface maps and cross section data, review of pre-existing seismic reflection data, 2-dimensional high resolution seismic reflection along Jefferson Boulevard, 3-dimensional seismic survey over the entire site, and off-shore geophysical data (Davis, 2000b)

Historic Seismicity

The moment magnitude (Mw) provides a physically meaningful measure of the size of a faulting event and is currently accepted by the scientific community as the measure of earthquake energy released during a seismic event. While the magnitude is a measure of the energy released in an earthquake, intensity is a measure of the ground-shaking effects at a particular location. Ground movement during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material. A common measure of ground motion is the peak ground acceleration (PGA), which expressed as the percentage of the acceleration due to gravity (g) or approximately 980 centimeters per second squared. The Modified Mercalli (MM) intensity scale, ranging from MM intensity of I to XII, is commonly used to measure earthquake ground motion intensity and is based on whether people can feel the earthquake and the observed effects of ground shaking. The MM intensity values ranging from I to II are typically not felt by people while intensity values between III and VII are felt by most and result in some damage. MM intensity values from VIII to the maximum value of XII represent strong to violent ground shaking and result in considerable structural damage and/or collapse.[3] The estimated moment magnitudes (Mw) shown in **Table 4.E-2** represent *characteristic* earthquakes on particular faults.[4] **Table 4.E-2** lists the major earthquake faults located within 25 miles of the PDR and MDR project areas and includes the expected size and intensity of a maximum earthquake on each of the faults.

During the past 230 years (1769 to 1999), Southern California has experienced about 20 notable earthquakes (Mw 6.0 or greater; where Mw is the moment magnitude). Six of these events equaled or exceeded Mw 7.0. The three largest earthquakes that occurred within the Los Angeles Basin during recent time are the January 17, 1994, Mw 6.7 Northridge earthquake; the October 1, 1987, Mw 5.9 Whittier-Narrows earthquake; and the February 9, 1971, Mw 6.4 San Fernando earthquake. The shortest distance from the site to the energy release zone (site-to-source distance) in these earthquakes is about 18, 22, and 31 miles, respectively.

Peak horizontal ground acceleration (PHGA) estimates indicate that the earthquake-induced ground motion would be generated by an Mw 6.9 event on the underlying Compton Thrust fault or an Mw 7+ event on the Newport-Inglewood fault. The California state-planning scenario for a major earthquake on the Newport-Inglewood fault zone assumes that an Mw 7 earthquake could subject the project area to seismic MM intensity of VIII+ to IX (Toppozada, et al, 1988). In 1933, the project site area experienced an intensity of VII+ during the 6.3 magnitude Long Beach earthquake. Even though no specific analysis has been conducted to determine actual values, a future earthquake on the buried Compton thrust fault may generate higher ground motion intensity than experienced during the 1933 event.

3 The damage level represents the estimated overall level of damage that will occur for various MM intensity levels. The damage, however, will not be uniform. Not all buildings perform identically in an earthquake.

4 The concept of "characteristic" earthquake means that we can anticipate, with reasonable certainty, the actual earthquake that can occur on a fault.

TABLE 4.E-2
EARTHQUAKE SITE PARAMETERS
WITHIN 25 MILES OF THE PROJECT AREA

		Estimated Maximum Earthquake		
			Mean Values	
Abbreviated Fault Name	**Approximate Distance** Miles (Kilometers)	**Maximum Earthquake Magnitude** (Mw)	**Peak Ground Acceleration** (g.)	**Estimated Site Intensity (MMI)**
Palos Verdes	4.1 (6.6)	7.1	0.424	X
Newport-Inglewood (L. A. Basin)	5.9 (9.5)	6.9	0.340	IX
Compton Thrust	6.2 (9.9)	6.8	0.591	X
Santa Monica	6.3 (10.2)	6.6	0.362	IX
Malibu Coast	7.2 (11.6)	6.7	0.346	IX
Hollywood	8.6 (13.8)	6.4	0.272	IX
Elysian Park Thrust	14.1 (22.7)	6.7	0.307	IX
Anacapa-Dume	14.8 (23.8)	7.3	0.260	IX
Raymond	16.6 (26.7)	6.5	0.156	VIII
Verdugo	18.0 (28.9)	6.7	0.161	VIII
Northridge (E. Oak Ridge)	18.0 (29.0)	6.9	0.270	IX
Sierra Madre	21.4 (34.5)	7.0	0.160	VIII
Sierra Madre (San Fernando)	22.6 (36.4)	6.7	0.126	VIII
Whittier	24.1 (38.8)	6.8	0.102	VII
Santa Susana	24.2 (39.0)	6.6	0.109	VII

SOURCE: EQFAULT Computer Program (Blake, 2000)

GEOLOGIC AND SEISMIC HAZARDS

Surface Fault Rupture

Surface fault rupture can occur in cases where earthquakes are large or occur at shallow depths. With the exception of the Compton Thrust Fault and the low angle Elysian Park Thrust Fault, which lies at 8,000 to 10,000 feet beneath the storage zone, no known active faults capable of causing surface offset underlie the project area and the Storage Zone. A major, near-vicinity earthquake could possibly cause minor movement (probably < 1.0 foot) at depth within the storage zone, but such offset is unlikely to propagate to within several hundred feet of the surface. Because surface fault rupture is more likely on active faults, the State of California, through the Alquist-Priolo Earthquake Zoning Fault Act, places active faults in zones that restrict development. No Alquist-Priolo zones traverse the project area and the potential for surface fault rupture at the site is considered very low. Presently, documentation indicates that the storage zone contains no fault offsets. As discussed above, previous reports infer various faults in other areas of the field, but these reports do not provide evidence of their presence (Davis, 2000).

Considering the absence of active faults capable of causing surface fault rupture, the potential for fault rupture at the project sites is low and is therefore not evaluated further in this document.

Earthquake Ground Shaking

The numerous active earthquake faults within 50 miles of the project area will continue to subject the southwestern Los Angeles Basin and the project area to strong seismic shaking during large earthquakes. Earthquakes are unavoidable and will occur throughout the useful life of the project. Earthquakes in the region could generate long duration ground shaking capable of causing injury and severe structural damage. The potential for activity on a blind thrust is possible and if it were to occur, the ground motion could be higher than some buildings could tolerate. Earthquakes that generate strong ground shaking could trigger movement on other nearby fault zones. Estimated PHGA generated by earthquakes on the San Andreas Fault, Newport-Inglewood, and Elysian Park Thrust Fault should range from about 0.1 g to 0.7 g. These earthquakes would generate enough energy and have a sufficiently long duration, to damage project facilities, adjacent structures, and area residences.

Induced Seismicity

Microseismic activity, with magnitude from 0 to 1 Mw, often occurs during injection and extraction operations (Terralog Technologies, 2000). Activity of this magnitude can be anticipated at PDR during operations, and is not significant relative to natural daily seismicity in the Los Angeles area. Earthquakes in this magnitude range would not cause subsurface fault movement of more than an inch and would not be felt at the surface and therefore, the impacts would remain less than significant and microseismicity is not evaluated further in this EIR.

Slope Stability

Slope failures, also commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Exposed rock slopes undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience shallow soil slides, rapid debris flows, and deep-seated rotational slides. Landslides may occur on slopes of 15 percent or less; however, the probability is greater on steeper slopes that exhibit old landslide features such as scarps, slanted vegetation, and transverse ridges. Landslides typically occur within slide-prone geologic units that contain excessive amounts of water, are located on steep slopes, or where planes of weakness are parallel to the slope angle.

The MDR area is located on low-relief topography along the coastline north of the bluffs and therefore slope instability is not an issue or a potential impact at the MDR sites. Areas along the northern boundary of PDR are delineated by the State of California as Seismic Hazard Zones for earthquake-induced landslides (see *Applicable Regulations, Plans, and Policies* below). The five lots making up Clusters 10 and 11 in the PDR area have steep slope angles with slope heights of more than 50 feet in Quaternary marine terrace deposits. However, these areas are not included in the areas designated as Seismic Hazard Zones.

Liquefaction and Other Secondary Earthquake Effects

Liquefaction is a phenomenon whereby unconsolidated and/or near-saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in temporary, fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, underground cables, and buildings with shallow foundations. Liquefaction can occur in areas characterized by water-saturated, cohesionless, granular materials at depths less than 40 feet. The depth to groundwater influences the potential for liquefaction; the shallower the groundwater, the higher potential for liquefaction.

Young, unconsolidated dune sand and lagoon sediments underlie the MDR area over a shallow, tidally-influenced groundwater table. Because of the shallow underlying geologic materials and the groundwater conditions, the MDR is delineated by the State of California as a Seismic Hazard Zone for liquefaction (see *Applicable Regulations, Plans, and Policies* below) The materials in this area, namely saturated sands and coarse grain lagoon sediments could fail and liquefy during a major earthquake. Liquefaction hazard at the PDR sites is not an impact due to the location and presence of geologic materials not susceptible liquefaction.

Subsidence

Removal of oil and gas (or other fluids) from poorly consolidated geologic formations can cause surface subsidence. These fluid withdrawal processes can leave void spaces at depth. Unless refilled with fluids by re-pressurization techniques, poorly consolidated sediments may collapse causing subsidence in the shallower earth layers. The same general process can occur when groundwater is withdrawn from unconsolidated aquifers. There is no indication that groundwater withdrawal is taking place in the project area, therefore the potential for subsidence is low and not evaluated further in this EIR.

In October 2000, the City of Los Angeles, Department of Public Works (LADPW) evaluated surface elevation changes in the PDR project area. During the period from 1975 to 2000, the maximum surface subsidence observed on one location was 2.66 inches. This occurred at an elevation marker placed in the curb of Manchester Boulevard at the intersection of Hastings Avenue. LADPW concluded that area surface subsidence identified during their evaluation was likely associated with settlement of curbs, sidewalks and gutters along major streets and not localized or regional subsidence.

Although the oil storage zone is well-consolidated, complete withdrawal of all storage gas (including cushion gas) may cause minor surface subsidence. No specific studies for the PDR field indicate this level of subsidence. For the Montebello Field (with somewhat similar geology) studies estimate two inches of subsidence distributed over a broad area (Terralog Technologies, 2000). Since the field will remain in operation, measurable surface subsidence is not anticipated. The potential damage to surface structures attributable to minor amounts of subsidence is not significant and therefore not evaluated further in this EIR.

Expansive Soils

Expansive soils possess a "shrink-swell" behavior. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage may occur over a long period of time, usually the result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. There may be portions of the project area that could contain expansive soils. Adverse effects due to expansive soils, such as those that could damage a building foundation or road, can be overcome by adequate investigation and engineering design.

Soil Erosion

Erosion is the wearing away of soil and rock by processes such as mechanical or chemical weathering, mass wasting, and the action of waves, wind, and underground water. Soils containing high amounts of silt or clay can be easily erodable while sandy soils are less susceptible. Excessive soil erosion can eventually lead to building foundation and roadway damage. At the project sites, areas that are underlain by fine grained material and areas where the soil is exposed during the construction phase are susceptible to erosion.

The shallow (within a few feet of the ground surface) soil, alluvium, and bedrock formations underlying the project will have varying susceptibility to soil erosion due to their unconsolidated nature and/or level of compaction. Running water and steep slopes are the primary components that trigger erosion of unprotected soil surfaces.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

This section presents a discussion of applicable laws and regulations that address geologic hazards in California, applicable to the project site.

STATE

Alquist-Priolo Earthquake Hazards Zone Act of 1972

The Alquist-Priolo Earthquake Hazard Zone Act (formerly the Alquist-Priolo Special Studies Zones Act), signed into law in December 1972 [5] requires the identification of zones along sufficiently active and well-defined faults. Development is limited in areas defined as Earthquake Hazard Zones, and structures for human occupancy are generally not permitted. Development proposals for both public and private structures in an Earthquake Hazard Zone require detailed geologic/seismic hazard evaluations before a use permit is issued. No active faults capable of generating surface fault rupture traverse the project area and therefore this act does not apply to the lots proposed for sale.

Seismic Hazards Mapping Act[6]

[5] California Public Resource Code, Section 2621.
[6] California Public Resource Code, Section 2690.

The Seismic Hazards Mapping Act of 1990 was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. The Act requires the property owner of a parcel within a designated seismic hazard zone to conduct an appropriate geological/geotechnical investigation in accordance with the *California Geological Survey Guidelines for Evaluating and Mitigating Seismic Hazards* (CGS Special Publication 117). This investigation must be completed before the lead agency grants the building permit[7].Appropriate mitigation measures must be incorporated into the project design. Seismic hazard zone maps outline areas that are considered susceptible to liquefaction and earthquake-induced landslides. MDR, including the lots proposed for sale, is designated under the Seismic Hazards Mapping Act as a liquefaction hazards zone by CGS (CGS, 1999). . Limited areas along the north bluffs of PDR are steeply sloped and have been designated in accordance with the Seismic Hazard Mapping Act as areas with a potential for earthquake-induced landslides (CGS, 1999). The lots are not within the areas designated as seismic hazard zones because the gradient, geologic material, and the expected response to ground shaking at the lots do not represent a potential seismically-induced slope failure hazard. If the slope areas that are designated Seismic Hazard Zones do fail during an earthquake, the lots are not close enough to be affected.

California Building Code

The California Building Code (CBC) is another name for the body of regulations known as the California Code of Regulations (CCR), Title 24, Part 2, which is a portion of the California Building Standards Code. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable (Bolt, 1988).

Published by the International Conference of Building Officials (ICBO), the Uniform Building Code (UBC) is a widely adopted model building code in the United States. The CBC incorporates by reference the UBC with necessary California amendments. About one-third of the text within the CBC has been tailored for California earthquake conditions (ICBO, 1997). The national model code standards that include Title 24 apply to all occupancies in California except for more stringent modifications adopted by state agencies and local governing bodies.

The project area is located within Seismic Zone 4, as delineated under the UBC and CBC. This area is one of the four seismic zones designated in the United States, and is considered an area with greatest earthquake risk. This region is expected to experience damaging ground shaking effects from earthquake and therefore has the most stringent requirements for seismic design. For sites within Zone 4, the CBC and UBC require additional earthquake ground motion analysis and more conservative construction criteria to avoid structural collapse during the characteristic earthquakes possible within this zone.

[7] Lead agency is the state agency, city, or county with the authority to approve projects (CCR Title 14, Section 3721b)]

California Division of Oil, Gas and Geothermal Resources

The California Division of Oil, Gas & Geothermal Resources (DOGGR) regulates production of oil and gas, as well as geothermal resources, within the state of California. DOGGR regulations are defined in CCR, Title 14, Chapter 4 (see Appendix F). DOGGR regulations define well design and construction standards, surface production equipment and pipeline requirements, and well abandonment procedures and guidelines.

- DOGGR regulates well abandonment procedures to ensure they are conducted safely and are effective. These regulations require procedures designed to prevent future migration of oil and gas from a producing zone to shallower zones, and to protect groundwater.
- DOGGR oversees well operations. When an operator ceases well operation or production, state law requires the well is abandoned within a reasonable period of time.
- Regulations require well operators to maintain detailed records of abandonment operations and file copies with DOGGR.
- DOGGR also regulates environmentally sensitive pipelines within 300 feet of any public recreational area, or a building intended for human occupancy (residences, schools, hospitals, and businesses) that is not necessary to the production operation.

LOCAL

County of Los Angeles, Department of Public Works

For projects involving site grading and earthmoving, the County of Los Angeles, Department of Public Works (DPW), Building and Safety Division, has jurisdiction to ensure the safety of workers during construction and the public once the project is constructed. DPW, City of Los Angeles grading and earthmoving requirements are specified in the County Building Code (including the latest version of the Uniform Building Code (UBC) and the procedures outlined in the County Hydrology Manual.

City of Los Angeles

The City of Los Angeles, Building and Safety Department, regulates design and construction of commercial and high occupancy structures located over areas with potential for gas reaching the surface. These areas typically include oil and gas resource areas (active and abandoned oil and gas fields), landfills, and other areas where shallow subsurface gas has been documented.

The City of Los Angeles Fire Department prohibits construction of dwellings closer than 50 feet from an operating oil well. The Fire Commission may grant variances not exceeding 10 percent of the required clearances. Any substantial reduction in clearances should impose additional safeguards from fire and fire exposure. Upon completion of well abandonment procedures, the Los Angeles Fire Department conducts a final inspection of the well site.

Along with the DPW, the City issues permits for project-related grading activities within the city, monitors project-related construction activities if applicable, and ensures compliance with permit

requirements. The City issues final project approvals and a certificate of occupancy (if applicable) when they receive verification of compliance to inspections and requirements.

SIGNIFICANCE CRITERIA

A soils or geologic impact would be considered significant if it would result in any of the following, which are adapted from CEQA Guidelines, Appendix G:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction; or
  - Landslides
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property; or
- Underlying geology produces preferential pathways for trapped subsurface gases to migrate to the surface resulting in adverse conditions and substantial risk to future residents and customers or commercial establishments.

Certain topics related to geology and seismicity are not discussed in this analysis because they are not considered potential impacts of or to the project. These topics are discussed below.

- The project area is not located in a low-lying area or adjacent to a large body of water where tsunami and seiches could cause inundation and damage.
- The project would not alter or destroy a unique geologic feature such as an unusual rock formation (with limited distribution), fossil location, geologic structure (such as a cave), or a significant mineral occurrence.
- The project will not include the use of septic tanks or alternative wastewater disposal systems because municipal wastewater systems would provide sewage service.

ENVIRONMENTAL IMPACTS AND MITIGATION

This impact analysis considers impacts related to the geologic and seismic hazards that could be affected by or affect the reasonably foreseeable future development of the 36 lots. Actual transfer of property ownership of the 36 PDR and MDR lots from SCG to new owners would not result in geologic or seismic impacts. However, development of the site would attract more people to the

project area thereby exposing more people to hazards related to seismicity and unstable soil and slope conditions. The proposed development could affect geology by reducing natural slope stability through construction grading or could lead to additional erosion and soil loss due to construction activities.

Impact E.1: If commercial or residential development occurs on the project lots and a major earthquake occurs in the region, seismic ground shaking could potentially injure people residing or visiting the project lots and could cause collapse or damage to structures if placed on the lots. An earthquake could cause damage to abandoned or unknown well casings. (Less than significant with recommended mitigation)

Surface Damage from Earthquakes

The numerous active earthquake faults within 50 miles of the project area will continue to subject the southwestern Los Angeles Basin and the project area to strong seismic shaking during large earthquakes. Earthquakes are unavoidable and may occur throughout the useful life of the project. Earthquakes in the region could occur on one of the numerous faults in the Los Angeles Area and generate long duration ground shaking capable of causing injury and severe structural damage. Blind thrust faults (discussed previously in setting section), although not likely to cause ground rupture, have the potential to cause a moderate to large earthquake sometime in the future as Los Angeles experienced in 1987 and 1999. If a blind thrust fault generated a moderate to high magnitude event, the ground motion could be higher than some buildings could tolerate. Earthquakes that generate strong ground shaking could also trigger movement on other nearby fault zones.

Because the Los Angeles is located within one of the most seismically regions in the United States, it is likely that the project area may experience at least one major earthquake (Mw 6.7 or higher) within the life of the development that would result from the project. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the moment magnitude, and the duration of shaking. A seismic event in this region could produce high ground acceleration and MM intensities ranging from strong (MM-VIIX) to very violent (MM-X). Based on the MM intensity scale, an earthquake of this intensity would cause considerable structural damage, even in well-designed structures. Substantial cracks could appear in the ground, and the shaking could cause other secondary damaging effects, such as the failure of underground pipes.

Damage to Well Casings

The magnitude of impact from seismic ground motion on the former oil reservoir and PDR Gas Storage Facility area is uncertain considering that it is unknown whether changes in the underlying geology, such as bedrock fractures, could develop preferential gas migration to the surface, especially through unabandoned, abandoned, or unknown well casings. Gas migration to the surface due to seismically-induced changes to the underlying strata or earthquake damage to a well casing would only be a significant impact if the gas that leaked to the surface represented an adverse impact to human health or the environment. Refer to Section 4.F, *Public Health* and

Section 4.G, *Public Safety* for additional discussion and analysis on human health and safety impacts associated with exposure to subsurface gas sources.

Post-1933 earthquakes within the Newport-Inglewood zone reportedly have damaged wells and well casings and a moderate earthquake on October 21, 1941damaged wells at a depth of 5,000 to 6,000 feet in the West Dominguez oil field (Toppozada et al, 1988). Although this may suggest that under certain seismic conditions and depths, earthquakes can damage well casings accessing the gas storage zone, the response of the well to seismic activity, and the magnitude of the resulting damage during an earthquake cannot be certain or predicted.

The PDR Gas Storage reservoir is about 6,000 feet deep and overlain by a thick and impermeable sequence of bedrock that provides a seal for oil and gas. There is no evidence that this sealing section is offset by through-going fractures. In addition, oil production and gas injection has produced an inverse pressure gradient that is present between the overlying seal and the PDR Gas Storage reservoir. The impermeable seal produced by the thick bedrock and the inverse pressure gradient make upward migration of hydrocarbons from the PDR Gas Storage Facility highly unlikely (Davis, 2000a).

DOGGR developed and enforces well abandonment standards to ensure that all wells are abandoned in a consistent manner to protect oil and gas zones, to prevent degradation of usable waters, to protect surface conditions, and for public health and safety.[8] DOGGR standards require that the wells be filled with impermeable plugs to seal and isolate gas zones. These requirements to fill and seal the wells with concrete, or other comparable sealing material, and its inspection and testing of the abandonment process, ensures that wells will seal existing and potential preferential gas migration pathways. Each of the wells associated with the lots were abandoned to DOGGR standards under supervision of the district deputy and therefore the potential is low that they could become a conduit or preferential pathway for gas migration to the surface after abandonment.

During an earthquake, the cement seal in the well could be damaged allowing a preferential pathway to form and gas to migrate to the surface. It is possible but not necessarily probable that earthquake ground motion could fracture the hardened concrete within the well to the extent that a continuous fracture would could form and allow gas migration. Furthermore, because of the inverse pressure gradient discussed above, even in the event that a well seal was fractured, there is a low potential for gas to escape to the surface.

The past uses of the wells are also considered in analyzing whether gas migration is possible when the well is damaged by an earthquake. With the exception of the Troxel 1 well, most of the wells associated with the lots proposed for sale did not have extended, direct contact with the storage reservoirs, as listed below:

- Abandoned wells, Joyce 1, Samarkand 1, 23-1, 29-1, and 29-2 in PDR were part of fluid recovery systems that were used in water removal and not directly involved with the gas storage area.

[8] California Code of Regulations, Title 14, Article 3, Section 1723

- The Anglo American Champ No.1 and O&M-1 well in PDR were not involved in storage operations.
- Hisey 1, Lor Mar 1, Merrill 1, and 13-1 in PDR were located in a smaller, separate reservoir that became saturated with water in the 1970s and was not used. The presence of water would significantly reduce, if not eliminate, contact with subsurface gas.

Brown and Caldwell conducted soil gas surveys and subsurface exploration studies to support the analysis for this EIR (Brown and Caldwell, 2004). Results of Brown and Caldwell's recent soil gas sampling verify the absence of soil gas in the shallow soils on the project parcels indicating that there is no leakage occurring from the project site well casings and surrounding geology. As discussed above, the migration of gas to the surface would only be an impact if that gas represented an adverse health hazard to the public on the associated lots. (Refer to Section 4.F, *Public Health* and Section 4.G, *Public Safety* for additional discussion and analysis on human health and safety impacts associated with exposure to subsurface gas sources.)

Based on the above analysis, it is not likely that earthquake ground shaking could damage the seal within an abandoned well to the point that quantities of subsurface gas could escape and represent a health and safety hazard and therefore, impacts related to this occurrence would remain less then significant.

Once the 36 project lots are developed, there would remain a high potential that seismic ground shaking could expose people to injury and property to damage in the event of a large regional earthquake. Although earthquakes are unavoidable, there are feasible measures and structural design to reduce the level of injury and building damage during an earthquake. The California Building Code (CBC) requires special seismic design criteria for commercial and residential structures in Seismic Zone 4 in California. Prior to design and construction, future development of the 36 project lots would require design under the CBC, which includes necessary geotechnical study to develop adequate soil strength data. Under the CBC, structures would be designed and constructed to withstand the maximum magnitudes of the characteristic earthquakes on the regional faults. Mitigation Measure E.1 below is recommended by this EIR for future site development to ensure that impacts related to injury and structural damage in the event of an earthquake remain less than significant.

Recommended Mitigation Measure E.1: A site-specific, design level geotechnical investigation for each building (which is typical for any large development project) shall be required as part of this project. Each investigation shall include an analysis of expected ground motions at the site. The analyses shall be in accordance with applicable City ordinances and policies and consistent with the 1997 UBC (or any more recent version of the UBC adopted by the City of Los Angeles), which requires structural design that incorporates ground accelerations expected from known active faults. In addition, the investigations will determine final design parameters for the walls, foundations, and foundation slabs. The investigations shall be reviewed by a registered geotechnical engineer. All recommendations by the project engineer and geotechnical engineer shall be included in the final design. Recommendations that are applicable to foundation design, earthwork, and site preparation that were prepared prior to or during the project design phase shall be incorporated into the project. The final seismic considerations for the site

shall be submitted to and approved by the City of Los Angeles Department of Public Works. (Recommended for Future Development)

Significance after Recommended Mitigation: Less than Significant.

Impact E.2: In the event of a major earthquake in the Los Angeles region, the 36 lots proposed for sale would be subjected to seismic ground shaking and depending on the site-specific geologic conditions and level of ground motion, may be subjected to earthquake-induced, secondary ground failures including liquefaction, earthquake-induced landslides, and earthquake-induced settlement. (Less than significant with recommended mitigation)

As discussed above, ground shaking from earthquakes can cause certain types of soils and slopes to fail resulting in landslides and soil collapse. In the MDR area, seismic-induced ground failure could occur due to the unconsolidated alluvial material and high groundwater. Because of this, the MDR area is designated by the State of California as a Seismic Hazard Zone (see Regulatory Setting discussion above) for liquefaction. Liquefaction at the site could result in loss of bearing pressure, lateral spreading, sand boils (liquefied soil exiting at the ground surface), and other potentially damaging effects. The PDR area is not designated as a liquefaction zone because the underlying geology is more consolidated than the sediments in the MDR and the groundwater is deeper.

Unlike the MDR, some areas of the PDR are designated as a Seismic Hazard Zone for earthquake-induced landslides. In these areas, the combination of topography, underlying geology, and potential seismic response during an earthquake represent an area susceptible to slope failure during an earthquake, especially in saturated or overdeveloped slopes. There is also some limited potential for slope instability in natural slopes that could fail due to static forces. In other areas, development requiring new cut slopes, road building, or grading of terraces could reduce the overall stability of natural slopes leading to slope failure. The potential for slope failure is only present on lots within Clusters 10, 11, and 12. Slopes on these lots could fail under static or seismically-induced movement, or if grading would require terraces and cut slopes. Any unstable slopes that may be present locally could experience problems with or without future development of the lots.

The potential liquefaction hazard could directly impact the MDR development and seismically-induced landslides could impact the PDR development (in certain areas). Typically, potential liquefaction and landslide hazards, if adequately investigated, can be reduced with appropriate engineering. Areas within a designated Seismic Hazard Zone must undergo prescribed evaluation and mitigation prior to development. Because appropriate and accepted investigation and engineering techniques are available to mitigate potential liquefaction and landslide hazards, this impact would remain less than significant with mitigation recommended for future development, as discussed below.

Recommended Mitigation Measure E.2: A site-specific, design level geotechnical investigation shall be required for all lots prior to development, especially those lots that may be susceptible to secondary seismic ground failure. The investigation shall consider the proposed development designs and provide engineering recommendations for mitigation of liquefiable soils and seismically-induced ground failure resulting in landslides or soil collapse. These recommendations shall become part of the future project. Where applicable, prior to incorporation into the project, geotechnical engineering recommendations from previous investigations regarding the mitigation and reduction of liquefaction, landslides, and ground failure for each site shall be reviewed for compliance with California Geological Survey's (CGS) *Geology Guidelines for Evaluating and Mitigating Seismic Hazards (CGS Special Publication 117, 1997).* (Recommended for Future Development)

Significance after Recommended Mitigation: Less than Significant.

Impact E.3: If eventually developed for commercial or residential uses, some of the 36 project lots that are proposed for sale may be subject to geologic hazards attributable to expansive or settled soils and erosion. These hazards could cause risks to life and property. (Less than significant with recommended mitigation)

Soil conditions are variable throughout the MDR and PDR project areas and site-specific conditions on each of the 36 lots proposed for sale would not be determined without testing each lot. For this reason, there may be portions of the development area that could contain moderately to highly expansive soils or be porous and subject to consolidation under building loads. Adverse effects due to expansive soils typically occur in the first few feet of the soil column and can damage foundations, pavements, and utilities through cyclic shrink-swell behavior. Adverse effects can generally be overcome by adequate investigation and engineering design. Ground settlement that causes localized areas of the surface to settle beyond what a building can tolerate may be present on certain project lots. Over time, settlement could occur on the project site as a result of increased foundation loads from overlying structures being placed on semi-consolidated deposits, such as disturbed surface soils, the older sand dune deposits in PDR and the alluvial deposits underlying the MDR area. Settlements could potentially occur from static loads and possibly half of the settlement would take place during construction or shortly thereafter. Differential settlement could occur between column or floor slabs due to variability of underlying soil conditions. The recommended mitigation measure presented below would ensure potential impacts associated with expansive soils and settlement would remain less than significant.

Construction activities such as backfilling, grading, and compaction can expose areas of loose soil that, if not properly stabilized, could be subjected to soil loss and erosion by wind and storm water runoff. Concentrated surface water flows, occurring temporarily during construction activities or over the long-term after development, if not managed or controlled, can eventually result in significant erosion and soil loss. The City and County of Los Angeles require site grading and earthmoving projects to comply with the Department of Public Works requirements and the procedures outlined in the County Hydrology Manual to avoid erosion and loss of topsoil.

These requirements and procedures include the development of Best Management Practices to reduce erosion and sedimentation. As discussed in Section 4.H, *Hydrology and Water Quality*, the NPDES permitting program, as implemented by the State of California, addresses measures to reduce sedimentation and erosion in stormwater discharges for construction activities. Examples of protection measures include diversion dikes, silt fences, sediment traps or sediment basins, and mulching. Compliance with local grading codes, the requirements of the NPDES process, and required runoff controls for construction, such as Best Management Practices, would ensure that erosion hazards remain less than significant.

Recommended Mitigation Measure E.3: A site-specific, design level geotechnical investigation shall be required for all of the lots proposed for sale to determine the presence or absence of expansive soils or those soils that could not accommodate building loads. Such geotechnical investigations and reports shall include generally accepted and appropriate engineering techniques. Engineering recommendations shall become part of the future project. In addition, future developers shall adhere to local grading and construction policies to reduce the potential for geologic hazards, including differential settlement and soil erosion. All construction activities and design criteria shall comply with applicable codes and requirements of the California Building Codes and applicable local construction and grading ordinances. (Recommended for Future Development)

Significance after Recommended Mitigation: Less than Significant.

CUMULATIVE IMPACTS

Impact E.4: Future development of the 36 project lots, when combined with other foreseeable development in the vicinity, could result in cumulative impacts with respect to geology. (Less than significant)

As the future development of the lots proposed for sale and other redevelopment projects[9] in the MDR and PDR area near completion, additional people that would be subjected to seismic risks and hazards will come into the area. While the number of people visiting, living, and working in the area will increase incrementally exposing additional people to seismic and geological hazards over a short term, the trends of redevelopment in these areas will likely decrease the risk to people and property by upgrading or demolishing older buildings that are seismically unsafe. Older buildings will likely be seismically retrofitted and newer buildings will be constructed to stricter building codes. Thus, there are no expected cumulatively significant geology effects, nor would the project's contribution to any such effects be cumulatively considerable.

Mitigation: None required.

[9] These projects include, the Village at Playa Vista, Mountain Gate, Paradise Landmark Condominium Project, Brentwood Project, and Westside Medical Park. See Section 3.6 for more information about these cumulative projects.

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F. PUBLIC HEALTH

This Public Health section and Section 4.G. *Public Safety* make up the typical CEQA analysis area know as Hazards and Hazardous Materials. In this EIR, to provide clarity and ease of understanding, the Hazards and Hazardous Materials discussion is separated into two sections. This section evaluates public health risks that could result from exposure to toxic chemicals, as a result of the proposed sale and future development of the lots proposed for sale. The analysis also considers potential exposure to chemicals in the soil, soil vapor, and groundwater at the 36 lots proposed for sale. Abandoned wells on the lots and gas storage in the PDR field were considered when evaluating public health risks.

ENVIRONMENTAL SETTING

The environmental setting describes the types of existing gaseous chemicals at the 36 lots and the ways in which the chemicals may migrate through these lots and surrounding properties.

TYPES OF GASES

There are three types of gas that may exist within the geological and soil units underlying the project area: biogenic (or swamp) gas, thermogenic (field) gas, and processed natural gas (or piped gas). Biogenic gas is primarily methane with carbon dioxide and sulfide gases that result from decomposition of organic material in former lagoon deposits or other sources. Biogenic gas contains mostly methane and carbon dioxide with smaller amounts of ethane, propane, and butane. These biogenic gases are not toxic at low (ppm) levels; however, they act as asphyxiants at high concentrations. Biogenic gases contain trace quantities of other chemicals which are toxic at low levels (in the ppm range), including benzene, toluene, ethyl benzene, and xylene (BTEX). These (BTEX) are addressed in the human health risk assessment (HHRA) that was conducted for this project (see Appendix E). Methane and other asphyxiants are considered in Section 4.G, *Public Safety*. If there is sulfur present in the decomposing organic matter, these gases may also contain trace quantities of hydrogen sulfide.

Thermogenic gas is generated at depth when increased temperatures and pressures alter organic material. Similar to biogenic gas, thermogenic gas contains a broad range of gas components including methane, ethane, propane, and butane, as well as trace amounts of toxic gases, including hydrogen sulfide. The HHRA addresses the trace toxic gases, and Section 4.G, *Public Safety*, deals with the other gases which act as asphyxiants or present safety risks (explosion or fire).

In contrast to the biogenic gases and the thermogenic gases, processed natural gas is primarily methane that remains from thermogenic gas after most of the heavier gas components, including the toxic substances, are removed (usually less than 0.1 percent heavy thermogenic hydrocarbons). Processed natural gas is analyzed in the Section 4.G, *Public Safety*.

The gas types described above exhibit distinct chemical characteristics, which permit "finger-printing" or differentiation between gas types. In addition to lacking heavier gas components (propane, butane, ethane, etc.), the presence of helium in detectible amounts is a primary fingerprint for natural gas imported from the central United States and previously stored in the deep storage zone.

MIGRATION PATHWAYS

Natural gas of biogenic, thermogenic, and storage sources can migrate through the subsurface soil both vertically and laterally. Natural gas has been detected at the surface in the PDR area in the past, and both biogenic and thermogenic gases were detected in a soil gas survey conducted by ETI (2000) at the Playa Vista area just north of the PDR lots. In a second phase of the same Playa Vista project field study (ETI, 2001), storage gases were not observed in any of the measurements east of Lincoln Boulevard. Since these studies are inconclusive with regard to the distribution of underground gas levels in the project area, a new field measurement study was undertaken for this EIR analysis.

MAJOR PATHWAYS

Natural gas of biogenic, thermogenic, and storage sources can travel through a variety of man-made structures to migrate both vertically and laterally through the subsurface. A list of the most common man-made structures that could serve as vertical conduits include:

- Old abandoned oil and gas wells or dry holes
- Previously undocumented wells and dry holes
- Existing water extraction or injection wells
- Old abandoned water wells
- Monitoring wells
- Recently plugged and abandoned oil and gas wells (abandoned in accordance with current DOGGR regulations).

In addition to oil and gas wells, both active and abandoned water wells can serve as vertical conduits, especially in the upper 1,000 feet of geological section. Utility trenches, storm drain systems, and sewer lines provide lateral migration pathways, accumulation areas, and near-surface openings for natural gas release.

Gas can also reach the surface through natural geologic features, which may facilitate vertical, lateral, or oblique migration. The geologic features most likely to serve as potential pathways include:

- Surficial deposits
- Porous and permeable formations
- Aquifers

- Fracture systems
- Fault planes
- Other geologic features and structures, such as unconformities

The potential for gas migration to reach the surface is considered to be the greatest through or along man-made structures. In general, geologic pathways are relatively "tight" in the "shallow" and storage zones. Fractures, faults, and spaces between individual grains are minimized due to the tremendous overburden pressure (the weight of the rock materials). Within the project area, wells penetrate shallow and deep gas zones at various depths. Once penetrated, a poorly constructed or abandoned well can serve as a conduit for upward migration of natural gas. Even when proper construction and abandonment methods have been applied, such conduits can develop as old wells deteriorate (over 70 years).

NATURAL PATHWAYS

Gas can migrate naturally through fissures and cracks that have formed from faults in the region Section 4.E, *Geology and Soils* presents a full description of faults in the vicinity of PDR and MDR.

Abandoned Wells

Several factors, such as original drilling, development and completion, operations and redevelopment, and abandonment, contribute to possible gas migrations through abandoned and active wells. Historically, many wells and dry holes were drilled in the Los Angeles Basin during the exploration and early oil field development period; these dry or non-commercial wells were typically abandoned. Many of these wells and dry holes have a high potential to provide migration pathways because they may not have been abandoned in compliance with present current requirements and standards. All 12 wells associated with the lots proposed for sale were abandoned after 1956; most were abandoned in the early 1990s (see **Table 3-1**) in compliance with current requirements and standards.

Wells Leaks

Well construction, redevelopment, and abandonment deficiencies can contribute to gas migration. If cement bonds between the casing and surrounding natural formation do not form adequate storage seals, pressurized leakage is possible. Leakage through the annular space between the casing and formation can occur under the following circumstances: lack of proper seals; inadequate seal or poor cement bonds with bore walls; channels within cement; deterioration of annular seals over time; or fracturing or cavitation of enclosing walls.

When present, shallow high-pressure gas zones can create problems for cement annular seals. During well installation, cement slurry is pumped into the annular space between the hole drilled (rock face) and casing to form a seal. Gas from shallow high-pressure zones can enter cement within the annular space during this process. Gas bubbles within the slurry weaken the cement

and can compromise seals around these zones. In turn, poor seals can allow fluid migrations and enhance corrosion of both casing and cement in these areas. If large volumes of gas enter the annular space, vertical channels within the cement seal can also form (Marlow, 1989).

Over extended periods of time the structural integrity of well components and seals can deteriorate. Casings and seals are subject to corrosion caused by exposure to chemical attack, high and fluctuating pressures, high temperatures, and earthquakes. Steel casing is susceptible to rusting from saline and sour/sulfurous water produced along with the oil. Hydrogen sulfide in sour water and sour gas can corrode steel and cement. Differential earth stresses (i.e., local earthquakes) can affect well integrity, even causing casing to collapse. Any deterioration of well integrity can lead to leaks.

REPORTED LEAKING WELLS: SOUTHERN CALIFORNIA GAS

Leaks and surface seepage have been documented in 11 wells in the general PDR and MDR area. Information on these wells and their respective leaks are summarized in **Table 4.F-1**. Of the 10 wells with documented leaks, four are located on the lots proposed for sale: 29-1, Lor Mar 1, Joyce 1 and Troxel 1. Casing leaks in each of the four wells has been repaired. As indicated on **Table 3-1**, Lor Mar 1, Joyce 1, 29-1 and Troxel 1 were plugged and abandoned in 1992, 1993, 1994, and 1994 respectively. There have been no reported leaks in the other eight wells included in the proposed sale.

GAS RESPONSIBILITY AND RIGHTS

SCG owns most mineral rights in the PDR gas storage field and is therefore responsible for any gas leaks originating from the PDR Gas Storage Facility (both aboveground facility and associated operating wells) from thermogenic sources. California Public Resources Code, Section 3251.5 states that if an abandoned well leaks and requires remedial work 15 or more years after it was properly abandoned according to all requirements at the time of abandonment, the state must assume financial responsibility for the remedial work.

UPDATED SITE INVESTIGATION AND MEASUREMENTS

A comprehensive site investigation and measurement program was conducted by Brown and Caldwell to update existing hazardous chemicals conditions at the 36 lots proposed for sale. Total petroleum hydrocarbons (TPH) were measured in the soil and in the soil vapor at the project lots (Brown and Caldwell, 2004). To measure TPH and toxic chemicals that affect human health (BTEX and semivolatile organic chemicals), samples of soil, soil vapor, and groundwater were taken. The 2003 work program consisted of three phases, with each phase building on the previous phase to provide a comprehensive characterization of the properties (Brown and Caldwell, 2004a).

TABLE 4.F-1
SUMMARY OF DETECTED WELL GAS LEAKS

Well Name	Problem	Depth (ft bgs[a])	Year Detected	Well Locations
Well No. 29-1	**Stage collar leak**	**723**	**1959**	**Between Falmouth Avenue & Calabar Avenue, south of intersection with Cabora Drive**
Big Ben 1	Casing leak	150	1964	Between 79th Street & Veraqua Drive, northeast Zayenta Drive
	Surface seepage		1991	
Blackline 1	Casing leak	1,064	1969	South of Cabora Drive, west of Veraqua Drive and Zayenta Drive intersection
	Casing leak	1,060	1986	
SoCal No. 4	Casing leak	3,216	1971	NW of Cabora Drive, about 1,000 ft. NE of intersection with Falmouth Avenue[b]
SoCal No. 3	Casing leak	3,300	1972	NW of Cabora Drive, about 1,000 ft. NE of intersection with Falmouth Avenue[b]
	Casing leak	3,300	1975	
	Casing leak	2,109	1977	
Well No. 12-1	Surface seepage	481	1974	Southeast of 81st Street, north of intersection with 83rd Street
	Casing leak	210	1979	
Well No. 24-2	Surface seepage	191	1975	Northwest of 79th Street, west of Zayanta Drive
Pomoc 1	Casing leak	2,815	1975	West of Zayanta Drive, between 79th St and Cabora Drive
Joyce 1	**Casing leak**	**750**	**1987**	**Northwest of 82nd Street, east of Saran Drive**
Lor Mar 1	**Casing leak**	**720**	**1981**	**South of 83rd Street, east of Saran Drive**
Troxel 1	**Marsh Gas Bubbles**	**<1000**	**1994**	**Union Jack Street and between Speedway Avenue and Venice Beach**

[a] ft bgs – feet below ground surface.
[b] Surface location of directionally drilled well. Bottom hole locations were not made available.

SOURCE: DOGGR, Brown and Caldwell

In Phase 1, conducted in June 2003, soil vapor samples were collected at 133 locations on the 36 lots. Sampling took place at these locations, at depths from 5 to 10 feet, to determine whether soil vapors were present and to identify permanent soil vapor monitoring wells locations for the next phase of the investigation. In Phase 2, conducted in July 2003, soil samples at 34 locations on the project lots, at depths of up to 30 feet below ground surface (bgs) and one boring being 80 feet deep, were collected. Fourteen permanent soil vapor monitoring points were installed; with at least one at each cluster. At Cluster 12, soil samples were collected, groundwater wells were installed, and a soil vapor well was installed. In Phase 3, conducted from August 2003 to December 2003, four vapor sampling events were monitored at 14 semi-permanent soil vapor points. Four groundwater sampling events were also conducted at monitoring wells at Cluster 12 (Brown and Caldwell, 2004a).

Sampling included 86 soil samples; 48 of which were collected at depths of 15 feet bgs or less. Exposure levels were established based on the sampling. Hydrocarbons were detected in 16 of the 48 soil samples. Five samples were analyzed for semivolatile organic chemicals; however, none were found.

To gain soil vapor measurements, 175 samples were taken from temporary vapor sampling locations during the Phase 1, and 56 soil vapor samples were taken from 12 semi-permanent vapor monitoring wells in Phase 3 of the sampling program. Benzene was not detected in any of the temporary vapor sampling locations. The other chemicals, BTEX and TPH as gasoline, were identified in 20 of the semi-permanent vapor samples during Phase 3. No chemicals were detected at Cluster 12.

In Phase 3, four rounds of sampling were conducted over four months during periods of varying temperatures and pressures. The results of the sampling show that in the permanent vapor sampling locations, all chemicals included in the analysis were detected in one or more samples with a frequency ranging from nine percent of the sites detecting benzene to 80 percent detecting toluene.

There were 21 groundwater samples taken from five wells at Cluster 12. BTEX and/or TPH were detected in most of the samples. The results of the sampling are given in Table 5 of Appendix A of the Human Health Risk Assessment conducted by Brown and Caldwell (see Appendix D). Table 5 shows that the measured levels of all of the BTEX species are well below California action levels for drinking water standards, except for benzene (see Appendix D). Four of the 21 samples of benzene were slightly above the action level, and the other 17 samples were below the detection limit. However, these action levels are established for drinking water, and the groundwater at Cluster 12 is brackish that is heavily influenced by the tides and cannot be used for human consumption. Thus, there are no health risks to humans from these measured benzene levels in the groundwater.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

The current regulatory framework relevant to hazards and human health encompasses process risk related to the use of hazardous materials and management of risks from hazardous materials that have been released to the environment. The use, storage, and disposal of hazardous materials and wastes are regulated through a network of overlapping federal, state, and local laws and regulations. Various government agencies are responsible for implementing these laws and enforcing their requirements.

FEDERAL

Federal and state laws require planning to ensure that hazardous materials are properly used, stored, and disposed of, and in the event that such materials are accidentally released, to prevent or to reduce injuries to human health, safety, or the environment. Businesses must store hazardous materials appropriately and train employees to manage them safely. Hazardous waste laws impose cradle-to-grave liability, requiring generators of hazardous wastes to handle them in a manner that protects human health and the environment to the extent possible. Since Federal jurisdiction related to hazardous waste in California has been delegated to the State, and regulation is covered by the state rules which are described below.

STATE

California Code of Regulations Title 22

Title 22 of the California Code of Regulations defines, categorizes, and lists hazardous materials and wastes. Title 22 defines a hazardous material as:

> "a substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (2) pose a substantial present of potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed."

Hazardous wastes are categorized in Title 22 as either hazardous wastes, as defined in the Resource Conservation and Recovery Act (RCRA) or non-RCRA hazardous wastes. Title 22 lists chemicals that are presumed to make a material or waste hazardous to the environment. The chemicals measured in both the soil and groundwater (benzene, toluene, and xylene) are all on the list of hazardous materials, as identified in Section 66261.126 of Title 22.

California Water Code (CWC)

The California Water Code (CWC) includes provisions of the federal Clean Water Act (CWA) and water quality programs specific to California. The CWC requires reporting, investigation, and cleanup of hazardous material releases that could affect waters of the state (including storm waters).

California Aboveground Petroleum Storage Act

The California Aboveground Petroleum Storage Act, implemented by the Regional Water Quality Control Boards (RWQCBs), regulates the storage of petroleum in aboveground storage tanks (ASTs) and requires construction methods and monitoring to prevent petroleum releases.

California Health and Safety Code Section 25534

Section 25534 of the California Health and Safety Code requires businesses that handle amounts of acutely hazardous materials (AHMs) in excess of certain quantities to develop a risk management plan (RMP). The RMP encompasses process hazards, potential consequences of releases, documentation, auditing, and training relative to the AHMs that are above specified threshold quantities at the generating station. Regulated AHMs may include aqueous ammonia and sulfuric acid, as well as other acutely hazardous substances.

California Department of Conservation, Division of Oil, Gas and Geothermal Resources and CPUC

Physical hazards, storage field maintenance and operations within the PDR Gas Storage Facility are under the jurisdiction of DOGGR and the CPUC. DOGGR regulates the operations and maintenance of natural gas storage fields the CPUC regulates aboveground offsite piping. DOGGR manages oil and gas resources in California, including the PDR gas storage field. The City of Los Angeles has local responsibility and authority through land use permitting and zoning for both oil and gas production and quarry and mining operations. The City also has zoning jurisdiction through special use permits and overlays for oil and gas.

The Regulations require that DOGGR inspectors look for indications of any type of oil or gas leaks from wells, pipelines, pressure vessels, and tanks. They also witness testing of the automatic shut down equipment on each well. Storage project performance reviews take place annually. During these reviews, DOGGR engineers examine SCG records to ensure that all well and reservoir monitoring and leak survey requirements are met.

Well Abandonment Regulations and Policies

DOGGR has adopted regulations[1] for safe and effective well abandonment (see Appendix F). These regulations provide well abandonment procedures that prevent future migration of oil or gas from the producing zone and the upper zones, as well as protect groundwater. Furthermore, DOGGR ensures that public safety is not endangered. DOGGR has the expertise and the authority to require steps deemed necessary to protect public safety, up to and including requiring facilities to cease operations and/or remove all gas from a field.

After subsurface abandonment is completed and surface portions of a well are removed, the owner of the well must test and remove soil that has been contaminated by oil or other well maintenance substances. At the end of abandonment operations, DOGGR completes a final inspection of the

[1] These regulations can be found in California Code of Regulations, Title 14, Chapter 4, see Appendix F.

well site. After this inspection, DOGGR reviews all of the abandonment records of the operator and provides a final abandonment approval or a notice of deficiency that must be corrected.

Significance Levels Established by Regulations

Several state regulations have established levels of TACs above which certain actions should be taken. These actions may be equivalent to the definition of significance thresholds under CEQA, and are described below.

Air Toxics "Hot Spots" Bill AB2588

Assembly Bill AB2588, the Air Toxics "Hot Spots" Information and Assessment Act, requires that facilities emitting Toxic Air Contaminants (TACs) above specified thresholds to prepare a health risk assessment, and if the cancer risk threshold of 10 in 1 million is exceeded off the property or the Hazard Index of one is exceeded, the results of the risk assessment must be communicated to the public in the form of notices and public meetings. The proposed sale and future development would not be considered a facility under the definition contained in the Regulation, and it would not be subject to AB2588. However, the cancer risk threshold defined by the regulation can be used as a CEQA significance threshold for this proposed sale. This same threshold has been applied to other CEQA projects by local air pollution control agencies in the State.

Proposition 65

Proposition 65, also known as the Safe Drinking Water and Toxic Enforcement Act of 1986, prohibits businesses with ten or more employees from knowingly discharging any chemical listed as "known to the State of California to cause cancer or reproductive toxicity" to a source of drinking water, and requires that such businesses provide a clear and reasonable warning prior to exposing any persons to a listed chemical. Similar to the AB2588 Regulation, the threshold for warning is 10 in 1 million for carcinogens and a hazard index of 1.0 for non-carcinogens.

Regulations Regarding Building Construction over Abandoned Wells

Future development of the lots proposed for sale would be subject to the requirements of the City of Los Angeles Building Code and would include compliance with all requirements for construction over abandoned wells**.** The regulatory requirements for building over abandoned wells are discussed in Section 4.E, *Geology and Soils*.

SIGNIFICANCE CRITERIA

Adverse public health affects are determined based on cancer risk caused by exposure to Toxic Air Contaminants (TACs) and other adverse health risks caused by exposure to non-carcinogenic TACs (see also Section 4.A, *Air Quality*). Cancer risks are expressed as increased chances in a million of contracting cancer from exposure to chemicals from the project. The accepted significance threshold for the maximum incremental cancer risk from a project is 10 in 1 million.

This includes the regulation under AB2588, as well as Proposition 65. Also CEQA guidelines for several air districts in the state, such as the Bay Area Air Quality Management District, recommend a significance threshold of 10 in 1 million.

Non-cancer adverse health risks are measured against a hazard index, which is the ratio of the predicted exposure concentration to a threshold level, which could cause adverse health effects, as established by the Cal/EPA's Office of Environmental Health and Hazard Assessment (OEHHA). The ratio (Hazard Index or HI) of each non-carcinogenic substance affecting a certain organ system is added to the calculated Hazard Indices of the other non-carcinogens to produce an overall Hazard Index for that organ system. Overall Hazard Indices are calculated for each organ system. If the overall Hazard Index for the highest-impacted organ system exceeds one, then the impact would be significant. The Hazard Index significance threshold of one is defined in CEQA Guidelines in several air districts and is consistent with the value requiring public notification in the AB 2588 regulation and Proposition 65.

ENVIRONMENTAL IMPACTS AND MITIGATION

Impact F.1: Development and occupation of the lots proposed for sale could result in impacts to public health. (Less than significant)

This impact refers to the potential for exposure to toxic air contaminants under normal conditions. The impacts from potential accidents and hazards are addressed in the Section IV.G, *Public Safety*. Impacts to public health would result from development of the lots proposed for sale. During future construction, emissions of diesel particulate matter (DPM) from the construction equipment would result in increased exposure levels of DPM near the construction activities. However, these emissions would be temporary and would not contribute significantly to chronic long-term exposure levels of DPM. In addition, compared to existing equipment, emissions of DPM from engines in the future would be reduced considerably (by up to 90 percent) because strict regulations are being enacted for new equipment.

During construction, there is the potential for exposure to contaminants that may be contained in the soil during excavation activities. Similarly the levels of chemicals that future residents of the lots could be exposed to were estimated from the measured concentration of each chemical reported in the site assessment. The highest concentration for each chemical was used, regardless of location. This would result in the estimation of a maximum possible health risk. The maximum concentrations for assessing health risks are reported in the HHRA (see Appendix E).

From these measurements, a hypothetical lot was created that contains the highest measured concentration of each chemical. This approach resulted in an upper-bound estimate of a possible worst case exposure since exposure at any individual lot would be lower.

Public health risks associated with the proposed sale and future development include the carcinogenic or adverse non-carcinogenic health effects in the community that result from exposure to TACs. Cancer risk is defined as the lifetime probability of developing cancer from

exposure to carcinogenic substances, and is expressed as the increased chance of contracting cancer. More than one exposure pathway (i.e., inhalation, dermal contact, ingestion of contaminated soil, etc.) is incorporated in a health risk assessment. As stated above, the CEQA significance threshold for cancer risk is established at 10 in 1 million. The risk assessment, which uses the maximum detected concentration as the exposure level, is designed to overestimate the potential risk so that an actual risk, if any is present, would be less than the calculated risk.

Non-cancer adverse health risks are measured against a hazard index, which is the ratio of the predicted exposure concentration to an established threshold level that could cause adverse health effects. The Hazard Index of each non-carcinogenic substance is added to the calculated Hazard Indices of the other non-carcinogens to produce an overall Hazard Index. A significant impact would occur if the total Hazard Index exceeds 1.0.

Risk Characterization Results

The maximum risks from exposure to carcinogens by various exposure pathways are summarized in **Table 4.F-2**. As shown in **Table 4.F-2**, the maximum probability of contracting cancer at future residences as a result of the project, assuming 30-year exposure at any of the lots, is 0.4 in 1 million ($4x10^{-7}$), which is less than the significance threshold of 10 in one million.

Table 4.F-2 also shows that the maximum Hazard Index is 0.6, which is less than the significance threshold of 1.0. Therefore the public health impacts would be less than significant for all chemicals. **Table 4.F-2** also gives a breakdown of the pathways affecting health risks and the principal exposure pathway is inhalation of indoor air.

Uncertainty of Risks

Uncertainties in assessing health risks are dependent on several factors including: uncertainty in measurement data upon which exposure estimates are based; uncertainties in the exposure pathways and prediction of human activities that lead to contact exposure to chemicals and the models used to calculate exposure levels; and uncertainties in the toxicity of specific chemicals and the toxicity of combinations of chemicals.

Uncertainties in the measurement of chemicals were minimized by using the most appropriate analytical methods to assure that quantities were accurately measured and a large number of samples were taken to ensure that potential high readings would not be missed. To compensate for uncertainties in the exposure assessment, the exposure concentration for each pathway was based on the maximum concentration of each chemical, regardless of where the chemical was detected. The standard approach is to use a weighted average of all the concentrations measured in the exposure unit. In the toxicity assessment, there is uncertainty because of extrapolations from animal experiments to human health effects. However, the mathematical models used in the extrapolations are designed to be protective of human health. Therefore, for every condition where there is uncertainty, the health risk assessment used the most conservative assumptions to ensure that the risks were over-estimated.

TABLE 4.F-2
SUMMARY OF CANCER RISKS AND HAZARD INDICES

Chemical	Cancer Risk			Hazard Index		
	Soil	Outdoor Air	Indoor Air	Soil	Outdoor Air	Indoor Air
Chemicals Identified in Soil Vapor Samples						
Benzene	---	---	4E-07	---	---	0.002
Toluene	---	---	na	---	---	0.003
Ethylbenzene	---	---	na	---	---	0.007
m-, p-Xylene	---	---	na	---	---	0.4
o-Xylene	---	---	na	---	---	0.1
Chemicals Identified in Soil Samples						
Benzene	9E-10	2E-09	---	0.00002	0.000008	---
Toluene	na	na	---	0.0000003	0.0000003	---
Ethylbenzene	na	na	---	0.0000006	0.0000002	---
Xylenes	na	na	---	0.0000003	0.000001	---
TPH (C6-C10)	na	na	---	0.003	0.006	---
TPH (C10-C22)	na	na	---	0.08	0.06	---
TPH (C22-C36)	na	na	---	0.01	0.00001	
TOTAL	**9E-10**	**2E-09**	**4E-07**	**0.09**	**0.06**	**0.5**
Total Cancer Risk	**4E-07**					
Total Hazard	**0.6**					

--- = media not used to evaluate the indicated pathway soil data was used to evaluate ingestion of soil, dermal contact with soil and inhalation of volatiles and particulates in outdoor air soil vapor data was used to evaluate inhalation of volatiles in indoor air
na = chemical is not a carcinogen, cancer risks were not calculated

SOURCE: Brown and Caldwell, 2004

Mitigation: None required. Los Angeles City Building Code requires additional mitigation for methane and other gases be implemented when construction occurs at these sites. These additional measures include the installation of membrane barriers and vent piping as well as trench dams and electrical seal offs for each of these properties. Since these measures are already required by regulation, they are not mitigation measures according to CEQA, and the public health impacts at these clusters would be less than significant.

Impact F.2: Future development and related construction activities could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. (Less than significant)

All of the PDR lots are located less than 0.25 miles away from at least one of the three local schools:

- Westchester High School
- Paseo del Rey Elementary School
- St. Bernard High School

Cluster 12, located in the MDR area, is not located within 0.25 miles of any school. The health risk assessment described in Impact F.1 evaluated health impacts at locations on the property sites and found no significant impacts. For the schools that are farther away than the residences, the impacts would be even lower. Therefore the impacts to the schools would be less than significant.

Mitigation: None required.

CUMULATIVE IMPACTS

Impact F.3: Public exposure to toxic chemicals from the future development of the 36 lots proposed for sale and other projects or cumulative development could result in an increase in health risks in the project area. Under that condition, the proposed sale's increases in health risks, in combination with other cumulative projects, would be less than significant. (Less than significant)

The relevant cumulative projects identified in Section 3.6 of this EIR, in combination with the future development of the proposed sale were evaluated to determine the project's public health impacts. The cumulative projects include residential and commercial development[22]; none of which are expected to be significant sources of toxic chemicals. Therefore, these cumulative projects would not contribute to issues related to public health. However, one or more of the cumulative projects described in Section 3.6 of this EIR could be located on land that may have the potential to release toxic gases when the projects are built. Because local regulations have strict requirements that are designed to limit emissions from the soil, exposure levels from cumulative projects would be minimal, and such cumulative impacts would be less than significant.

Mitigation: None required.

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2 These projects include, the Village at Playa Vista, Mountain Gate, Paradise Landmark Condominium Project, Brentwood Project, and Westside Medical Park. See Section 3.6 for more information about these cumulative projects.

REFERENCES – Public Health

Brown and Caldwell, 2004, *Human Health Risk Assessment, Southern California Gas Company, Playa del Rey Gas Storage Facility*, March 2004.

Brown and Caldwell, *Field Investigations of Soil and Soil Gas at Playa del Rey and Marina del Rey*, April, 2004a.

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Jennings, C.W., *Fault Activity Map of California and Adjacent Areas*, California Division of Mines and Geology Data Map No. 6, 1:750,000, 1995.

Kleinfelder, Inc., *Human Health Risk Assessment, Playa Vista Development*, Los Angeles, CA: Report prepared for the City of Los Angeles, Department of Public Works, February 6, 2001.

G. PUBLIC SAFETY

This section and the preceding Section 4.F. *Public Health*, make up the typical CEQA analysis area known as Hazards and Hazardous Materials which has been separated into two sections in this EIR for clarity and ease of understanding purposes. This section evaluates impacts to public safety that could result from potential accidents related to subsurface gas storage. While the Public Health section discusses health impacts that could result from exposure to toxic gases, this section addresses potential accidental releases of methane gases in quantities sufficient to result in fires or explosions that could cause injury, or the accidental release of hydrogen sulfide (H_2S) gas, an acutely hazardous substance, that could cause adverse impacts. Measurements of these gases have been conducted in the vicinity of and at the lots proposed for sale.

ENVIRONMENTAL SETTING

PDR is primarily a residential community with some commercial uses; while MDR is a beach, harbor, and tourist-oriented community. The lots are found in 12 clusters of adjacent properties. Eleven of the clusters (containing 34 lots) are located in the PDR area and 1 cluster (comprised of 2 lots) is located in MDR. Each cluster is undeveloped; however subsurface materials were historically used for oil production and more recently for gas storage reservoir operations.

Leaks have occurred in the past at or near the wells located in the PDR Gas Storage Facility area, and gas leaks that have been measured in the past are summarized in **Table 4.G-1**.

Leaks and surface seepage have been documented in 11 wells in the general PDR and MDR area. Information on these wells and their respective leaks are summarized in **Table 4.G-1**. Of the 11 wells with documented leaks, four are located on the lots proposed for sale: 29-1, Lor Mar 1, Joyce 1 and Troxel 1. Casing leaks in each of the four wells has been repaired. As indicated on **Table 3-1**, Lor Mar 1, Joyce 1, 29-1 and Troxel 1 were plugged and abandoned in 1992, 1993, 1994, and 1994, respectively. There have been no reported leaks in the other eight wells included in the proposed sale.

UPDATED SITE INVESTIGATION

In 2003, an updated site investigation was conducted to supplement previous methane measurements and to fully examine existing conditions at the lots proposed for sale (Methane Specialists, 2004). The investigation involved surface sweeps at the project lots to detect the presence of methane and to establish locations for installing probes in the ground to measure methane in soil gas.

A surface sweep is a method for measuring combustible vapors which may be emitted from the ground surface. The technique utilizes a sensitive portable gas detector, called a flame ionization detector (FID) to detecting methane. The FID is capable of measuring methane concentrations as low as several parts per million. To perform the surface sweep, the FID is attached to a measuring wheel, and is moved slowly in a serpentine path across each of the 12 Clusters. When

TABLE 4.G-1
SUMMARY OF PAST LEAKS DETECTED IN THE AREA

Well Name	Problem	Depth (ft bgs)	Year Detected	Well Location
Well No. 29-1	**Stage collar leak**	**723**	**1959**	**Between Falmouth Avenue & Calabar Avenue, south of intersection with Cabora Drive**
Big Ben 1	Casing leak	150	1964	Between 79th Street & Veraqua Drive, northeast Zayenta Drive
	Surface seepage		1991	
Blackline 1	Casing leak	1,064	1969	South of Cabora Drive, west of Veraqua Drive and Zayenta Drive intersection
	Casing leak	1,060	1986	
SoCal No. 4	Casing leak	3,216	1971	NW of Cabora Drive, about 1,000 ft. NE of intersection with Falmouth Avenue [a]
SoCal No. 3	Casing leak	3,300	1972	NW of Cabora Drive, about 1,000 ft. NE of intersection with Falmouth Avenue[a]
	Casing leak	3,300	1975	
	Casing leak	2,109	1977	
Well No. 12-1	Surface seepage	481	1974	Southeast of 81st Street, north of intersection with 83rd Street
	Casing leak	210	1979	
Well No. 24-2	Surface seepage	191	1975	Northwest of 79th Street, west of Zayanta Drive
Pomoc 1	Casing leak	2,815	1975	West of Zayanta Drive, between 79th St and Cabora Drive
Joyce 1	**Casing leak**	**750**	**1987**	**Northwest of 82nd Street, east of Saran Drive**
Lor Mar 1	**Casing leak**	**720**	**1981**	**South of 83rd Street, east of Saran Drive**
Troxel 1	**Marsh Gas Bubbles**	**<1000**	**1994**	**Union Jack Street and between Speedway Avenue and Venice Beach**

[a] Surface location of directionally drilled well. Bottom hole locations were not made available.

SOURCE: DOGGR

conducting the surface sweep, more attention was taken in areas where underground gas would tend to exit the surface, such as at vaults or cracks in the ground. Because the entire cluster is systematically covered, the surface sweep method is a good predictor of potential methane hazard at a cluster (Methane Specialists, 2004).

Surface sweep measurements are intended to identify any flow of gas from the surface of the ground. Finding such "advective" flow is a good indicator of potential pressurized flow of undiluted gas in the soil. The absence of such findings would suggest that there were no gross pressure flow phenomena were present at the time of monitoring. Surface sweep measurements taken on the 12 Clusters indicate that methane gas was not detected at any of the 36 lots (Methane Specialists, 2004).

SOIL GAS MONITORING

In conjunction with the environmental drilling and site investigation program of each of the 36 sites, methane measuring probes were installed to determine what gases were present in the soil[1] (Brown and Caldwell, 2004). Measurements were taken over an eight-month period, including methane and H_2S measurements, at shallow and deep probes at each site. H_2S was not found at any location at any time. With the exception of Cluster 11 and a singe low methane reading at Cluster 12, methane was not detected[2].

Elevated levels of methane in the soil gas were consistently found at Cluster 11. Methane readings ranged from 11.5 to 35 percent[3], which are above the lower explosive limit (LEL) of 5 percent. The LEL (also called the lower flammable limit, LFL) is defined by OSHA as the lowest concentration level above which a gas could sustain combustion if an ignition source were present.

A helium sample was taken from Cluster 11 for laboratory analyses to determine the signature of the observed methane. An isotope analysis of the helium sample was carried out to determine the origin of the gas (i.e., is it biogenic, thermogenic, or storage gas). Stable isotopes of helium are H^3 (atomic weight three) and H^4 (atomic weight four), and the ratios of these isotopes in the measurements would confirm the source of the detected gas, since gases of different origins have distinct isotopic "signature" ratios. The helium isotope analysis confirmed that the origin of the gas found at the Cluster 11 was not the same as storage gas, but more likely is a residual gas that is present naturally (mostly thermogenic) from the decomposition of contaminated soils from historical oil exploration activities (Methane Specialists, 2004).

At the Cluster 12 site, a single methane reading of 2.2 percent by volume was detected in July 2003 during installation of a borehole on site. However, subsequent samplings at the same location failed to detect any further elevated levels of methane at Cluster 12 (Methane Specialists, 2004). Because no further methane readings were observed at Cluster 12, it was not possible to conduct a helium isotope analysis of the singe Cluster 12 methane reading. In January 2004, Brown and Caldwell conducted a deep boring at Cluster 12 (Troxel) to determine if a geologic formation known as the "fifty-foot gravel layer" exists under the Troxel site (Brown and

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1 Referred to here as soil gas.

2 At the Cluster 12 site, a single methane reading of 2.2 percent by volume was detected in July 2003 during installation of a borehole on site. However, subsequent samplings at the same location failed to detect any further elevated levels of methane at Cluster 12 (Methane Specialists, 2004).

3 Methane readings are expressed here as percent of total sample volume. For example, a sample containing five percent methane would contain 95 percent other atmospheric gases, such as oxygen, nitrogen etc.

Caldwell, 2004). As Cluster 12 is located at near sea level and this gravel layer had been found under much of Playa Vista (located about a mile north of the PDR lots and several miles east of Cluster 12) there was a potential for this layer to exit under Cluster 12. The layer was named because it was first detected at an elevation of fifty feet below mean sea level and is described in more detail in Section 4.E, *Geology and Soils*. At Playa Vista, this fifty-foot gravel layer contained free soil gas in several discreet areas and dissolved methane in groundwater throughout. The deep boring was advanced to a depth of 60 feet below ground surface (bgs) and no evidence of the 50-foot gravel layer was noted. A very tight clay layer was detected from 55 to 60 feet bgs[4], likely minimizing the vertical migration of groundwater or gases (such as methane) in the area (Brown and Caldwell, 2004).

APPLICABLE REGULATIONS, PLANS, AND POLICIES

Federal and state laws require planning to ensure that hazardous materials are properly used, stored, and disposed of, and in the event that such materials are accidentally released, to prevent or to reduce injuries to human health, safety, or the environment.

FEDERAL

U.S. Occupational Safety and Health Administration Process Safety Management Rule.

To assure safe and healthful workplaces, the U.S. Occupational Safety and Health Administration (OSHA) has issued the Process Safety Management (PSM) of Highly Hazardous Chemicals standard (1910.119). This standard contains requirements for the management of hazards associated with processes using highly hazardous chemicals. OSHA's standard also establishes a comprehensive management program that integrates technologies, procedures, and management practices.

STATE AND LOCAL

California OSHA Injury and Illness Prevention Program

In California every employer is required by law (Labor Code Section) to provide a safe and healthful workplace for employees. Title 8 of the California Code of Regulations (CCR) requires every California employer to have an effective Injury and Illness Prevention Program in accordance with Title 8, CCR Section 3203, of the General Industry Safety Orders.

California Health and Safety Code Section 25534

Section 25534 of the California Health and Safety Code requires businesses that handle amounts of acutely hazardous materials (AHMs) in excess of certain quantities to develop a risk management plan (RMP). The RMP encompasses process hazards, potential consequences of releases, and documentation, auditing, and training relating to the AHMs that are above specified threshold quantities at the generating station. Regulated AHMs may include aqueous ammonia and sulfuric acid, as well as other acutely hazardous substances.

[4] Boring was stopped at 60 feet bgs and the additional depth of the clay layer is unknown.

California Department of Conservation, Division of Oil, Gas and Geothermal Resources and CPUC

Physical hazards and storage field maintenance and operations within the PDR Gas Storage Facility are under the jurisdiction of the California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) and the CPUC. DOGGR regulates the operations and maintenance of natural gas storage fields and aboveground piping is regulated by the CPUC.

Well Abandonment Regulations and Policies

DOGGR has adopted regulations for well abandonment to ensure that it is done safely and effectively. These regulations provide well abandonment procedures that prevent future migration of oil or gas from the producing zone and the upper zones, as well as protect groundwater. Furthermore, DOGGR is charged with ensuring public safety. DOGGR has the expertise and authority to require whatever steps are deemed necessary to protect public safety. Well abandonment is discussed in more detail in Section 4.E, *Geology and Soils*.

Regulations Regarding Construction of Buildings over Abandoned Wells

The City of Los Angeles has recently adopted a new and more stringent code for construction in areas prone to methane gas generation. The new code expands the official methane zone from the older, more limited Fairfax Area to now include all lands in the city overlying oil fields, plus a substantial buffer zone around the oil fields. The City code describes required mitigation measures for all structures in potential soil gas areas, whether gas is present or not. For areas where gas is present, additional measures are required, including soil gas venting, constructing barriers to interrupt gas migration pathways, and, in cases where gas is present, monitoring gas in the soil and at structures.

The Los Angeles City Fire Department requires electronic gas detectors, mechanical ventilation, alarms, and warning signs to be placed areas where methane gas is known to be present. The Fire Department must approve specifications on gas detection equipment and all plans for the placement of gas detectors.

SIGNIFICANCE CRITERIA

According to Appendix G of the CEQA Guidelines, the project would have a potentially significant impact if it would:

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous or flammable materials into the environment
- Emit acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

ENVIRONMENTAL IMPACTS AND MITIGATION

Impact G.1: Future construction and occupation of the lots proposed for sale could result in an explosion or in exposure to acutely hazardous substances. (Less than significant)

The field study, conducted by Methane Specialists and described above in the Setting, did not detect methane at Clusters 1 through 10 in PDR and Cluster 12 in MDR[5] (Methane Specialists, 2004). Because the highest measured soil gas levels at these sites are presently less than detection limits (a few parts per million), it is unlikely that soil gas will ever be present in concentrations that are considered unsafe at the sites in these clusters. Due to strict DOGGR requirements for well abandonment the wells on the project lots were vented prior to abandonment, there by preventing unsafe levels of gas buildup.

Methane gas was detected at Cluster 11 at levels up to 35 percent by volume. Helium isotope analysis of the soil gas did not show evidence of storage gas; rather, the measured gas was naturally-occurring gas. The helium isotope analysis indicated that the gas was formed locally. Based on field monitoring program data, there are no signs of advective gas flow caused by releases from stored gas reserves, at Cluster 11. Because it is unlikely that concentrations of methane could reach the LEL (five percent methane), in the absence of advective gas flow, the explosion hazard would be minimal. With compliance with DOGGR and City of Los Angeles requirements, conditions suggest that any housing units on the Cluster 11 properties would not be adversely impacted by a methane hazard. Therefore, in addition to Clusters 1-10 and 12, public safety impacts at Cluster 11 would be less than significant.

Mitigation: None required because the City of Los Angeles Building Code requires that methane mitigation be implemented when construction occurs at these sites to ensure public safety. These measures include the installation of membrane barriers and vent piping as well as trench dams and electrical seal offs for each of these properties. Since these measures would already be required by City regulation, no additional mitigation measures are required.

Impact G.2: Future development of the 36 lots proposed for sale could result in the release of acutely hazardous substances resulting in unsafe levels at nearby schools. (Less than significant)

The PDR lots are located less than 0.25 miles from at least one of three local schools (Westchester High School, Paseo del Rey Elementary School, or St. Bernard High School). As discussed in Impact G.1, under worst case conditions, structures built directly on the properties would not be adversely affected by methane, and the impacts at these worst-case locations would be less-than-significant. Therefore, for locations farther from the clusters, such as the schools, the impacts would be less than significant.

[5] At the Cluster 12 site, a single methane reading of 2.2 percent by volume was detected in July 2003 during installation of a borehole on site. However, subsequent samplings at the same location failed to detect any further elevated levels of methane at Cluster 12 (Methane Specialists, 2004).

Mitigation: None required.

Impact G.3: Future development of the 36 lots proposed for sale could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (Less than significant)

SCG has an existing emergency response plan for the PDR Gas Storage Facility and associated pipelines. Because the sale of the 36 lots would not result in any physical changes to SCG's existing operations, this plan would remain in effect. Because SCG would no longer own the lots proposed for sale, these lots would no longer be part of the plan; however, it is unlikely that accidental releases at the 36 lots would occur. In addition, the 36 lots are located in already-developed neighborhoods and future development of the lots would not likely interfere with existing emergency response plans or emergency access in the project area. Construction activities associated with future development of the 36 lots would be subject to local CEQA review and implementation of any mitigation measures that might be required to eliminate potential impacts to local emergency response plans and emergency access.

Mitigation: None required.

CUMULATIVE IMPACTS

Impact G.4: Cumulative development projects in the area, along with the future development of the 36 lots proposed for sale could result in the storage or release of flammable or acutely hazardous substances that could impact the public. (Less than significant)

Future cumulative development, described in the Chapter 3, *Project Description*, identifies new residences or light commercial development that might occur in the area in the future. None of this future development would include facilities that store or use acutely hazardous substances which could impact public safety. In addition, construction and occupation of facilities would be subject to the same regulations as the future development of the 36 lots, as described in Impact G.1, above, which would prevent the migration of underground gases maintaining public safety. Compliance with DOGGR and City regulations would either prevent or minimize cumulative impacts to public safety.

Mitigation: None required because existing DOGGR and City of Los Angeles regulations already contain mitigation measures that must be implemented prior to development. Since these measures are required, they are not considered as mitigation measures under CEQA.

REFERENCES – Public Safety

Brown and Caldwell, *Field Investigations of Soil and Soil Gas at Playa del Rey and Marina del Rey*, April, 2004.

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Methane Specialists and Sullivan Consulting Group, *Surface Emission Survey and Odor Monitoring Work Plan, Sites in Playa Del Rey and Marina Del Rey*, May 12, 2003.

Methane Specialists, *Methane Soil Gas at 36 Residential Lots, Playa del Rey / Marina del Rey, Los Angeles, CA*, March 29, 2004.

H. HYDROLOGY AND WATER QUALITY

ENVIRONMENTAL SETTING

REGIONAL

Much of the surface water runoff for the region is collected in street drain inlets and conveyed in large underground sewers westward via the Ballona Channel and the 78,000-acre Ballona Creek watershed, which services the heavily urbanized Los Angeles, Culver City, and Beverly Hills areas. Ballona Creek services the north slope of the Baldwin Hills and portions of the Santa Monica Mountains to the north. The eastern extent of the watershed reaches Interstate-110 near downtown Los Angeles. The channel empties into the Santa Monica Bay near the MDR marina and the Ballona Wetlands. As the channel nears the ocean, it becomes a tidally influenced estuary. Along the coast, stormwater and urban runoff are conveyed directly to the beach through local sewers and drainage canals. The City and County of Los Angeles Department of Public Works are responsible for maintaining storm drains to minimize flooding within their jurisdictions. Flooding has been minimized for the region through the construction of storm drains, flood control channels, detention basins, and pumping plants.

Water quality of regional surface water and groundwater resources is affected by point source and non-point source discharges occurring throughout individual watersheds. Regulated point sources, such as wastewater treatment effluent discharges, usually involve a single discharge into receiving waters. Non-point sources involve diffuse and non-specific runoff that enters receiving waters through storm drains or from unimproved natural landscaping. Common non-point sources include urban runoff, agriculture runoff, current and historical resource extraction, and natural drainage. Urban runoff has been proven to be a significant source of pollutants for surface receiving waters. Pollutants in urban runoff include urban debris, suspended solids, bacteria, viruses, heavy metals, pesticides, petroleum hydrocarbons, and other organic compounds. Through the regional Basin Plans, the Regional Water Quality Control Boards (RWQCBs) establish water quality objectives for surface water and groundwater resources and designate beneficial uses for each identified waterbody.

The general quality of groundwater in the district has degraded substantially compared with historic levels. Much of the groundwater degradation reflects the various land uses types including agricultural and urban. Fertilizers and pesticides typically used on agricultural lands can infiltrate and degrade groundwater as will septic systems and leaking underground storage tanks. In addition, when increased withdrawals from groundwater basins exceed sustainable yields, salt water intrusion from the ocean further degrades groundwater quality. Conversely, as impervious surfaces in urban areas increase, the rate of natural surface recharge declines. Groundwater basins are recharged through local precipitation and through imported water applied through injection wells or percolation ponds. Regional groundwater levels are at or near sea level (Chambers, 2000).

LOCAL

Playa del Rey Groundwater

The 34 PDR lots are situated at the northern limits of the El Segundo Sand Hills. These PDR lots are located over the West Coast Groundwater Basin, which is a small groundwater basin within the southwestern part of the Los Angeles County Coastal Plain. The basin is bounded by the Santa Monica Basin to the north, Palos Verdes Hills to the southwest, San Pedro Bay to the southeast, and the Newport-Inglewood Uplift to the east (Brown and Caldwell, 2003).

Depth to first groundwater beneath the project area was estimated at approximately 110 to 150 feet below ground surface based on the Coastal Plain Deep Aquifer Groundwater Contour Map. This map suggests that the local water table exists above the top of the Gage aquifer. The map also indicates that the overall groundwater flow direction within the vicinity of the project sites is northeasterly. No groundwater was encountered at any of the 34 PDR lots during any remedial excavations or subsurface exploratory work to a maximum depth of 34 feet (Brown and Caldwell, 2003).

Marina del Rey Groundwater

Based on past investigations, first encountered groundwater occurs beneath the MDR sites at a depth of about 11 feet, which is at or near sea level. The same investigations suggest that the groundwater is in apparent hydraulic communication with Santa Monica Bay. As a result, the depth to groundwater and groundwater gradient may fluctuate with tidal flows. MDR is located within the Santa Monica Basin of the Coastal Plain of Los Angeles County. The Santa Monica Basin is bounded by the Santa Monica Mountains to the north, the Newport-Inglewood fault to the east, the West Coast Basin to the south and the Santa Monica Bay to the west. The Santa Monica Basin includes six physiographic areas; the Santa Monica Plain; Ocean Park Plain; Sawtelle Plain; and portions of Beverly Hills, Ballona Gap, and Baldwin Hills (DWR, 1961). The two MDR lots lie within the Ballona Gap.

Surface Water Hydrology

Three major surface water bodies are located within one mile from the 36 lots (Brown and Caldwell, 2003). The distance and direction of each surface water body is summarized below in **Table 4.H-1**.

Storm Drainage

The PDR lots are located on the Westchester Bluffs that drain northward on Falmouth Street to the Ballona Wetlands on the southern edge of the channelized Ballona Creek. No underground storm sewers exist in the streets within the project area. For both the PDR and MDR lots, stormwater runoff is collected in gutters and transported offsite. The PDR lots drain to Manchester Avenue and then ultimately to the Ballona Wetlands along Falmouth Street. The MDR lots drain directly westward onto Venice Beach.

TABLE 4.H-1
NEARBY SURFACE WATER BODIES

Surface Water Body	Distance/Direction from PDR	Distance/Direction from MDR
Santa Monica Bay – Pacific Ocean	3,500 feet west	1,000 feet west
Ballona Creek	2,200 feet northwest	1,700 feet southeast
Marina del Rey	2,700 feet northwest	650 feet southeast

SOURCE: Brown and Caldwell, 2003

According to the City of Los Angeles Safety Element, the two lots located in MDR are within a 100-Year flood zone, directly on the beach at an elevation of less than 15 feet above mean sea level (amsl). The PDR properties are approximately 150 feet amsl and not within a flood zone.

Tsunami

Tsunamis are extremely long-period waves often associated with underwater earthquakes. Other mechanisms such as volcanic activity or submarine landslides can also generate tsunamis. Due to its proximity to the Pacific Ocean and its low-lying elevations, the MDR area is subject to potential tsunami hazards. The maximum expected run-up of a tsunami wave in Venice Beach is approximately 9.6 feet in a 100-year time frame from a distant earthquake. Tsunamis generated from local earthquakes may be larger; however, they are less likely to occur.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

FEDERAL

The U.S. EPA is the federal agency responsible for water quality management and administration of the federal Clean Water Act (CWA). The U.S. EPA has delegated most of the administration of the CWA in California to the California State Water Resources Control Board (SWRCB). The SWRCB was established through the California Porter-Cologne Water Quality Act of 1969 and is the primary state agency responsible for water quality management issues in California. Much of the responsibility for implementation of the SWRCB's policies is delegated to the nine RWQCBs.

Section 402 of the CWA established the National Pollutant Discharge Elimination System (NPDES) to regulate discharges into "navigable waters" of the United States. The U.S. EPA authorized the SWRCB to issue NPDES permits in the State of California in 1974. Non-point source NPDES permits are required for municipalities and unincorporated communities of populations greater than 100,000 to control urban stormwater runoff. These municipal permits include Storm Water Management Plans (SWMPs). A key part of the SWMP is the development

of Best Management Practices (BMPs) to reduce pollutant loads. Certain businesses and projects within the jurisdictions of these municipalities are required to prepare Storm Water Pollution Prevention Plans (SWPPPs) which establish the appropriate BMPs to gain coverage under the municipal permit. On October 29, 1999, the U.S. EPA finalized the Storm Water Phase II rule which requires smaller urban communities with a population less than 100,000 to acquire individual storm water discharge permits. The Phase II rule also requires construction activities on one to five acres to be permitted for stormwater discharges.

The RWQCBs also coordinates the State Water Quality Certification program, or Section 401 of the CWA. Under Section 401, states have the authority to review any federal permit or license that will result in a discharge or disruption to wetlands and other waters under state jurisdiction, to ensure that the actions will be consistent with the state's water quality requirements. This program is most often associated with Section 404 of the CWA which obligates the U.S. Army Corps of Engineers to issue permits for the movement of dredge and fill material into and from "waters of the United States."

STATE AND REGIONAL

California Water Code, Division 7, Chapter 5.6 established a comprehensive program within the SWRCB to protect the existing and future beneficial uses of California's enclosed bays and estuaries. In addition, the RWQCBs conduct water sampling for Water Quality Assessments required by the CWA and for specific priority areas under restoration programs (Los Angeles Department of Water and Power, 2004).

The RWQCBs have prepared Basin Plans, which identify beneficial uses and water quality objectives for each water resource in the state. The SWRCB also issue NPDES permits. The NPDES permits include waste discharge requirements that establish water quality thresholds to maintain designated water quality objectives and beneficial uses. The NPDES permitting program includes stormwater discharges for municipal storm sewer systems, industrial activities, and construction activities. To obtain coverage under the statewide general construction stormwater discharge NPDES permit for a construction site greater than 1 acre, a project proponent must prepare a SWPPP outlining BMPs to be employed to avoid water quality impacts to local receiving waters. In addition, pursuant to Section 303(d) of the CWA, the SWRCB has compiled a list of impaired water bodies in the state. The list includes Ballona Creek, Ballona Estuary, and the Ballona Creek Wetlands, (City of Los Angeles, 2001).

SIGNIFICANCE CRITERIA

A hydrologic or water quality impact would be considered significant if it would result in any of the following, which are adapted from CEQA Guidelines, Appendix G:

- Violate any water quality standards or waste discharge requirements
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local

groundwater table level (e.g., the production of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)

- Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map or place within a 100-year flood hazard area structures which would impede or redirect flood flows
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam
- Result in the inundation of seiche, tsunami, or mudflow.

ENVIRONMENTAL IMPACTS AND MITIGATION

Impact H.1: Future development of the 36 lots proposed for sale could result is surface water degradation resulting in the introduction of additional pollutants to receiving water and violations to water quality standards or waste discharge requirements. (Less than significant)

Construction on the lots could produce pollutants that would have the potential to temporarily degrade the quality of receiving waters if not properly managed. The primary pollution of concern is sediment that results from excessive erosion of disturbed soils. Other potential pollutants include metals, pesticides, nutrients and soil additives, construction chemicals and fuel, and miscellaneous waste. No significant long-term impact to water quality is anticipated from construction activities. Once constructed, the development of the lots would not substantially degrade water quality. Although landscaping could increase pesticide and fertilizer usage on the sites, the infill development would not substantially alter the existing residential nature of the two neighborhoods or the quality or character of the runoff. The contribution to urban runoff from each lot would be minimal.

Each lot is covered under the Municipal Separate Storm Sewer (MS4s) NPDES permit held by the County of Los Angeles, the purpose of which is to reduce the discharge of pollutants from MS4s to the maximum extent practicable. In addition, development of the lots could be subject to Phase II NPDES stormwater regulations for construction activities, which apply when there is soil disturbance of 1 acre, or if less than 1 acre, is part of a larger common plan of development that is 1 acre or greater. Since the lots are each less than 1 acre, they would not be subject to the statewide General Construction Storm Water NPDES permit requirements if they were developed separately. However, multiple lots developed at the same time such that the soil disturbance would add up to more than 1 acre would be required to obtain a SWPPP for coverage under the

statewide construction stormwater permit. Complying with state requirements to obtain coverage under the statewide stormwater permit would ensure that no impact to water quality standards or applicable waste discharge requirements would occur (Los Angeles County, 1984).

Since the PDR lots drain indirectly to Ballona Wetlands, development on each individual property may be subject to the Los Angeles RWQCB Standard Urban Storm Water Mitigation Plan (SUSWMP) requirements due to the designated sensitive ecological status of the wetlands. Finalization of the threshold requiring SUSWMP compliance has not yet been finalized. However, at the time of development of the 36 lots proposed for sale, it would be determined whether implementation of a SUSWMP for each site would be required. Implementation of a SUSWMP for the sites would ensure that stormwater runoff rates from each site would not be increased by development, and that urban runoff pollution would be minimized. This would require providing detention basins and potentially treatment systems to capture, reduce flow velocity, and treat the first 3/4 inches of each storm according the Los Angeles RWQCB requirements. Compliance with the SUSWMP requirements, if applicable, would ensure that stormwater runoff would not violate water quality standards or applicable waste discharge requirements.

Mitigation: None required because implementation of Los Angels RWQCB SUSWMP would be expected to fully mitigate potential impacts from future development on the lots proposed for sale.

Impact H.2: Future development of the 36 lots proposed for sale would increase impervious surfaces and reduce, over pre-project conditions, groundwater infiltration volumes and rates leading to a local reduction in groundwater recharge. (Less than significant)

Residential and/or commercial development on the 36 lots proposed for sale would replace existing pervious surfaces with impervious surfaces (i.e., pavement and roof tops) and could slightly reduce the volume and rate of local infiltration of stormwater into the groundwater basin. The stormwater basin partly depends on surface water infiltration for recharge of the underlying aquifers. However, the PDR and MDR lots likely do not contribute a significant source of recharge because of their relatively minor, combined surface area and location. The combined surface area of the lots accounts for a small percentage of the surrounding area and reduction of this amount of surface infiltration would have an unmeasurable effect on subsurface groundwater resources. Further, the PDR lots are located on the bluff, which rises approximately 150 feet above surrounding areas and surface water that infiltrates would not likely contribute to significant recharge of the regional aquifer which is more than 150 feet below the bluff. The MDR lots overlie a shallow, tidally-influenced groundwater water table and the contribution to the recharge of the water table is insignificant compared to recharge received from salt and fresh water under flow and other surface infiltration. The infill development of these individual lots would not significantly interfere with groundwater recharge or affect groundwater supplies.

Mitigation: None required.

Impact H.3: Future development of the 36 lots proposed for sale would create additional runoff that would contribute to existing runoff volumes and exceed the capacity of existing or planned stormwater drainage systems resulting in onsite flooding and downstream flooding. (Less than significant with recommended mitigation)

Development on the PDR and MDR lots proposed for sale could increase impervious surfaces (i.e., driveways, sidewalks, etc.) on each lot. This could slightly increase stormwater runoff. The infill development would occur in neighborhoods that have a street drainage system designed to accommodate the 50-year storm pursuant to the City of Los Angeles Department of Public Works design standard.

Recommended Mitigation Measure H.3: Prior to obtaining a building permit, future developers shall prepare a drainage plan for each site and submit it with the building permit application, as required by the City of Los Angeles Public Works Department.

The City of Los Angeles would approve each site's drainage plan prior to construction.

Significance after Recommended Mitigation: Less than significant.

Impact H.4: Future development of the 36 lots proposed for sale could place residences and commercial buildings within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map. (Less than significant)

The PDR lots are not located within a designated flood plain. Development in these lots would not place housing in a flood plain. Although the MDR lots are directly on the beach within the 100-year flood plain, development on these two parcels would be subject to City requirements regarding development within a flood plain. Development on these two parcels would alter the flood plain slightly, requiring a letter of flood plain revision to be submitted to the Federal Emergency Management Agency. Designs would require City approval to ensure that flood flows would not adversely affect neighboring structures. The floor of any habitable space would need to be at least one foot above the base flood elevation. Design and construction of the structures would be subject to City approval. As such, the City-approved infill development in the existing neighborhoods located in a flood plain would not be considered a significant impact.

Mitigation: None required.

Impact H.5: Future development of the 36 lots proposed for sale would expose people or structures to a significant risk of loss, injury or death involving inundation of tsunami. (Less than significant)

The PDR lots are not located within a tsunami or risk area. Some sites are located near steep inclines and cliff faces that could produce mudflows. The MDR lots are each located within the City-designated tsunami risk zone. Given the standard conditions set forth in the City of Los Angeles Flood Hazard Specific Plan providing development requirements, and the rare occurrence of such an event, the impact would be considered to be less than significant.

Mitigation: None required.

CUMULATIVE IMPACTS

Impact H.6: Future development of the 36 lots proposed for sale would increase site impervious surfaces and, therefore, add to the amount of runoff. (Less than significant)

Small local drainage systems and existing culverts in the area will be able to accommodate the increase in runoff due to the development of the area. The hydrologic impacts resulting from future development's incremental stormwater runoff would not have a cumulatively considerable impact because project drainage and flow control features would be implemented according to the approved future development project's drainage plan which would consider other relevant cumulative projects in the area.

Mitigation: None required.

REFERENCES – Hydrology and Water Quality

Brown and Caldwell, *Final Sampling and Analysis Plan, Southern California Gas Company Playa del Rey Divestiture Project*, June 6, 2003.

California Department of Water Resources (DWR), "Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County; Bulletin 104," In *Ground Water Geology*, 1961.

Chambers Group Inc., *Revised Supplement to Proponent's Environmental Assessment (PEA) for the SoCalGas Proposed Sale of Lots at Playa del Rey, California*, August 2000.

City of Los Angeles, *Decade of Progress Wastewater Program, 1990 – 2000*, 2001.

Los Angeles Department of Water and Power, *Green Power for a Green LA*, http://www.greenla.com/greenpower/index.htm, accessed February 23, 2004.

Los Angeles County, *Marina del Rey/Ballona Local Coastal Plan Phase II – Land Use Plan*, 1984.

I. NOISE

ENVIRONMENTAL SETTING

EXISTING NOISE ENVIRONMENT

Ambient noise levels in the PDR project area are principally affected by traffic on local streets and aircraft overflights associated with operations at LAX. The only major roadway in this neighborhood is Manchester Avenue, which supports a strip of commercial businesses in the southeastern portion of the project area. The intersection of Manchester Avenue and Falmouth Avenue in PDR lies approximately 0.75 miles northwest of the northernmost runway at LAX. Santa Monica Municipal Airport lies about three miles north of Manchester Avenue. Operations at this airport do not affect noise levels in the project area.

Aircraft overflights associated with LAX operations also affect ambient noise levels in the MDR lots. The two lots, located at the intersection of Union Jack Street and Speedway Avenue, lie approximately two miles northwest of the northernmost runway of LAX. Santa Monica Municipal Airport lies about three miles northeast of the Union Jack Street and Speedway Avenue intersection. As in PDR, operations at this airport do not affect noise levels in the project area. Unlike PDR, no major roadways run through the MDR project area. However, because the MDR lots are located directly on the Venice Beach strip, ambient noise levels in MDR are likely to be affected by ocean sounds.

The 1992 *Draft Environmental Impact Report (DEIR) for the Master Plan Project for Playa Vista* determined existing noise levels in the project area by modeling conditions at 23 locations within PDR and surrounding communities. Field measurements of traffic and stationary-source noise levels were compiled to verify the accuracy of the modeling results. Existing noise levels were identified based on modeling results and field measurements. Several of the modeled locations are within the project area (Chambers Group, 2000).

The Community Noise Equivalent Level (CNEL) at the six receptor locations within the project area ranged from a low of 51 A-weighted decibels (dBA)[1] at the Loyola Marymount University church to a high of 73 dBA in the vicinity of the church and YMCA facilities along Sepulveda Boulevard at 80th Street. Noise levels between 64 and 71 dBA characterize most receptor locations.

According to noise contours in the Los Angeles General Plan Noise Element, the southernmost areas of the PDR area along Manchester Avenue are very close to the 65 dBA CNEL contour for LAX.

[1] Decibels with the sound pressure scale adjusted to conform with the frequency response of the human ear. A sound level meter that measures A-weighted decibels has an electrical circuit that gives the meter the same sensitivity to sound at different frequencies as the average human ear.

SENSITIVE RECEPTORS

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication; physiological and psychological stress; and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hospitals, and nursing homes are considered to be the most sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive.

The 36 project lots are primarily located within residential areas. Hence, single-family homes or apartments abut most of the project lots, with the exception of Cluster 5, which is located adjacent to commercial uses.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

Any future development of the lots would be subject to regulations, plans, and policies developed by the State of California, the City of Los Angeles, and the Los Angeles County Airport Land Use Commission to limit noise exposure at noise-sensitive land uses. These include Title 24 of the California Code of Regulations (for new multifamily residential developments), the Los Angeles General Plan Noise Element, the Los Angeles Municipal Code (Chapter XI, Noise Regulation), and the Los Angeles Airport Land Use Plan.

STATE

Title 24 of the California Code of Regulations

State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings (other than detached single-family dwellings) that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are collectively known as the California Noise Insulation Standards and are found in California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior sources, the noise insulation standards set forth an interior standard, called the Day-Night Average Sound Level (DNL), of 45 dBA in any habitable room; where units are proposed in areas subject to noise levels greater than DNL 60 dBA, the standard requires an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard. If the interior noise level depends upon windows being closed, the design for the structure must also specify a ventilation or air-conditioning system to provide a habitable interior environment. As in most jurisdictions, Title 24 standards are enforced through the building permit application process in Los Angeles.

LOCAL

City of Los Angeles General Plan Noise Element

The City of Los Angeles General Plan Noise Element outlines guidelines for noise/land use compatibility for development and planning purposes. The Noise Element identifies compatible noise environments for different types of land uses in the city. **Table 4.I-1** contains the noise/land use compatibility guidelines for those types of land uses proposed as part of the project and the existing land uses that could be affected by project-related noise. These guidelines are to be used when evaluating the noise impacts of a proposed project.

TABLE 4.I-1
GUIDELINES FOR NOISE COMPATIBLE LAND USE

	Day-Night Average Exterior Sound Level (CNEL dBA)		
Land Use Category	**Acceptable**[a]	**Conditionally Acceptable**[b]	**Unacceptable**[c]
Residential	Up to 55	Up to 70	Above 70
Transient Lodging, Hotel, Motel	Up to 55	Up to 70	Above 70
School, Library, Church, Hospital, Nursing Home	Up to 55	Up to 75	Above 75
Playgrounds, Neighborhood Parks	Up to 65	Up to 75	Above 75
Office Buildings, Business, Commercial, Professional	Up to 65	Up to 75	Above 75

[a] Specified land use is satisfactory. No noise mitigation measures are required.
[b] Use should be permitted only after careful study and inclusion of protective measures as needed for intended use and to satisfy policies of the Noise Element.
[c] Development is not feasible in accordance with the Noise Element. Use is prohibited.

SOURCE: Los Angeles Department of City Planning, Noise Element of the Los Angeles City General Plan, February 3, 1999.

The Noise Element establishes specific programs and policies for airport, non-airport, and land use development projects. Applicable policies include the following:

- For a proposed development project that is deemed to have a potentially significant noise impact on noise-sensitive uses, require mitigation measures, as appropriate, in accordance with CEQA and City procedures. (P-11)

- Continue to plan, design, and construct or oversee construction of public projects, and projects on City-owned properties, so as to minimize potential noise impacts on noise-sensitive uses and to maintain or reduce existing ambient noise levels. (P-13)

- Use, as appropriate, the "Guidelines for Noise Compatible Land Use," shown in Table I-1, or other measures that are acceptable to the City, to guide land use and zoning reclassification, subdivision, conditional use and use variance determinations and environmental assessment considerations, especially relative to sensitive uses, within a

CNEL of 65 dBA airport noise exposure areas and within a line-of-sight of freeways, major highways, railroads, or truck haul routes. (P-16)

Los Angeles Municipal Code Noise Regulations

The City of Los Angeles has numerous noise ordinances and enforcement practices that apply to intrusive noise and that guide new construction. The City's comprehensive noise ordinance (Municipal Code Section 111 et seq.) establishes sound measurement criteria, minimum ambient noise levels for different land use zoning classifications, sound emission levels for specific uses (radios, television sets, vehicle repairs, and amplified equipment, etc.), hours of operation for certain uses (construction activity, rubbish collection, etc.), standards for determining a disturbance of the peace, and legal remedies for violations. Its ambient noise standards are consistent with current state and federal noise standards. The standards guide building construction, equipment installation, equipment maintenance, and nuisance noise enforcement.

The project is located within the city of Los Angeles and is subject to the General Plan and noise ordinances incorporated therein. Section 41.40 of the Los Angeles Municipal Code indicates that no construction or repair work shall be performed between the hours of 9:00 p.m. and 7:00 a.m. on any weekday, since such activities generate loud noises and disturb persons occupying sleeping quarters in adjacent hotel dwellings, apartments, or other places of residence. No person, other than an individual homeowner engaged in the repair or construction of his single-family dwelling, shall perform any construction or repair work of any kind before 8:00 a.m. or after 6:00 p.m. on Saturday, nor at any time on Sunday.

Section 112.05 of the Municipal Code specifies the maximum noise level of powered equipment or powered hand tools. Any powered equipment or powered hand tool that produces a maximum noise level exceeding 75 dBA at a distance of 50 feet from construction and industrial machinery shall be prohibited. However, the above noise limitation shall not apply where compliance is technically infeasible. "Technically infeasible" means that the above noise limitation cannot be complied with despite the use of mufflers, shields, sound barriers, and/or any other noise reduction device or techniques during the operation of equipment.

The City's Noise Ordinance also sets limits for noise levels generated by primary noise sources in an urban environment, such as radios, televisions, and other devices, air conditioning and heating equipment, construction noise, vehicular noise, noise from garbage collection trucks, noise from places of public entertainment, and other general noise.

Under Section 112.02, noise from air conditioning, refrigeration, and heating equipment would be considered excessive if caused the ambient noise level on the premises of an adjacent occupied property to increase by more than 5 decibels.

Mobile sources of noise are exempt from local ordinances, but are still subject to CEQA review, and would be significant if the project generates a volume of traffic that would result in a substantial increase in mobile-source-generated noise. Because most people can readily hear a change of 5 dBA in an exterior environment, this value was established for the project as the CEQA criterion for substantial change.

SIGNIFICANCE CRITERIA

Based on the CEQA Guidelines, a project may be deemed to have a significant effect on the environment if it would result in:

- Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- Exposure of people residing or working in the project area to excessive noise, for a project located within an airport land use plan or, where such a plan has not yet been adopted, within two miles of a public airport or public use airport; or
- Exposure of people residing or working in the project area to excessive noise, for a project located within the vicinity of a private airstrip.

ENVIRONMENTAL IMPACTS AND MITIGATION

Impact I.1: Future development on the lots could expose people to or generate noise levels in excess of standards established in the Los Angeles General Plan and Los Angeles Municipal Code. (Less than significant with recommended mitigation)

The sale of the lots would not expose people to or generate noise levels in excess of the local General Plan and noise ordinance standards. However, future development of the 36 lots could lead to increased noise levels in the area that could, in turn, affect existing land uses during construction and after construction (from additional traffic). Construction noise levels, at and near locations of the future developments, would fluctuate depending on the particular type, number, and duration of use of various types of construction equipment. The effect of construction noise and vibration would depend upon how much noise would be generated by construction, the distance between construction activities and the nearest noise-sensitive uses, and the existing noise levels at those uses. Typical noise levels generated by construction of commercial buildings at Cluster 5 (worst case scenario) range from 84 dBA during ground clearing to 105 dBA during pile driving (should this be required). These noise levels would be in excess of the City's noise ordinance standards discussed earlier in the Setting section. Monitored noise levels in the project area range from 51 dBA in the "acceptable" category to 73 dBA in the "unacceptable" category for residential uses. Therefore, construction associated with future development of the lots could potentially lead to significant, though temporary, impacts caused by noise and associated vibration.

Recommended Mitigation Measure I.1a: Limit construction activities to between 7:00 a.m. and 7:00 p.m. Monday through Friday. On weekends, construction would be limited to the hours between 8:00 a.m. to 6:00 p.m. in accordance with the City of Los Angeles Noise ordinance. (Recommended for Future Development)

Recommended Mitigation Measure I.I-1b: To reduce daytime noise impacts due to construction, construction contractors shall implement the following measures:

- **Equipment and trucks used for project construction shall utilize the best available noise control techniques (*e.g.*, improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds);**

- **Impact tools (*e.g.*, jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used where feasible, and this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment;**

- **Stationary noise sources shall be located away from sensitive receptors, and they shall be muffled and enclosed within temporary sheds or incorporate insulation barriers;**

- **Signs shall be posted at the construction site that include permitted construction days and hours, a day and evening contact number for the job site, and a day and evening contact number for the City in the event of problems;**

- **An onsite complaint and enforcement manager shall be posted to respond to and track complaints. The manager should be responsible for responding to any complaints regarding construction noise and for coordinating with the adjacent land uses. The manager should determine the cause of any complaints and coordinate with the construction team to implement measures warranted to correct the problem. The telephone number of the coordinator shall be posted at the construction site and provided to neighbors in a notification letter. The manager shall be trained to use a sound level meter and shall be available during all construction hours to respond to complaints; and**

- **A preconstruction meeting shall be held with the job inspectors and the general contractor/on-site project manager to confirm that noise mitigation and practices are completed prior to the issuance of a building permit (including construction hours, neighborhood notification, posted signs, etc.).**

(Recommended for Future Development)

Recommended Mitigation Measure I.1c: The future developers of the 36 lots proposed for sale shall notify adjacent neighbors of expected construction periods at least two week prior to the commencement of construction activities. (Recommended for Future Development)

Significance after Recommended Mitigation: Less than significant.

CUMULATIVE IMPACTS

Impact I.2: Future development of the lots could result in long-term traffic increases and could cumulatively increase noise levels. (Less than significant)

Noise impacts from future development in the PDR and MDR area would primarily occur from increases in motor vehicle traffic. Future development of the lots would most likely result in a modest number of trips which would be added into the existing neighborhoods of PDR and MDR, see Section IV.J, *Transportation and Traffic*. Noise impacts that could result from occupation of the residential homes that are anticipated to be constructed at the lots would be minimal. Although this impact cannot be quantitatively assessed until future development is defined and a traffic study (recommended as Recommended Mitigation Measure J.1) is conducted, noise impacts of future development of the 36 lots proposed for sale would not be cumulatively considerable.

Mitigation: None required.

REFERENCES – Noise

City of Los Angeles, *Los Angeles General Plan Noise Element*, February 1999.

City of Los Angeles, *Los Angeles Municipal Code, Chapter 11 - Noise Regulation*, January 31, 2004.

Chambers Group, *Proponent's Environmental Assessment (PEA) for the SoCalGas Proposed Sale of Lots*, 2000.

J. TRANSPORTATION AND TRAFFIC

ENVIRONMENTAL SETTING

Regional freeways in the project vicinity include the Santa Monica (I-10), San Diego (I-405), Anderson (I-105), and Marina (State Route 90) freeways. I-10 provides an east-west link to downtown Los Angeles. Interstate 405 is the major north-south link in west Los Angeles. Interstate 105 connects with Imperial Highway on the south side of Los Angeles International Airport (LAX). State Route (SR) 90 provides an east-west link from I-405 to MDR.

Several arterials and local streets serve the PDR lots. The arterials include Manchester Avenue (SR 42), Lincoln Boulevard (SR 1), Culver and Jefferson Boulevards (to the north), and Pershing Drive. Manchester Avenue is an east-west road that provides the primary connection from the PDR lots (on local residential streets) to the overall roadway network (eastward to Lincoln Boulevard and I-405, and westward to Pershing Drive). Lincoln Boulevard is a north-south roadway in the project area that connects with Sepulveda Boulevard at LAX to the south and extends north into MDR, Venice, and Santa Monica. Culver and Jefferson Boulevards are diagonally oriented, east-west roadways north of the PDR lots and connect PDR and coastal areas farther west with Culver City and the I-405 freeway. Pershing Drive is a north-south road that connects Manchester Avenue with Culver Boulevard to the north and Westchester Parkway to the south.

The clusters of lots within the PDR project area are served by a series of local roadways whose primary connection to the roadway network is Manchester Avenue. The local streets include Falmouth Avenue, Calabar Avenue, 79th through 83rd Streets, Saran Drive, and Gulana Avenue.

The MDR Peninsula / Venice area is served by a number of arterial and local streets. The arterials include Pacific Avenue, Washington Street/Boulevard (to the north), and Lincoln Boulevard (to the east). Pacific Avenue is a north-south street that extends from the Marina Peninsula to Venice and Santa Monica. Washington Street/Boulevard is an east-west street that begins at Pacific Avenue and runs east to Culver City and beyond. Lincoln Boulevard (SR 1) is a north-south street in the project area that connects with Sepulveda Boulevard at LAX to the south and extends north into Santa Monica. The two lots in the MDR project area are north of Union Jack Street, between Speedway Avenue and Venice Beach on the MDR Peninsula.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

THE COASTAL TRANSPORTATION CORRIDOR SPECIFIC PLAN

The *Coastal Transportation Corridor Specific Plan* was adopted by the City of Los Angeles in September 1993. The plan is intended to guide development and provide a mechanism to fund specific transportation improvements due to impacts generated by the projected new commercial and industrial development within the corridor. Relevant policies include the following:

- **Section 5.A.1:** Prohibition. No building, grading or foundation permit for a project shall be issued until the [Los Angeles] Department of Transportation and the City Engineer have certified completion of mitigation measures required by this section, or that their completion has been guaranteed to the satisfaction of these departments.

- **Section 5.A.2.a:** Exemptions. Single-family dwelling projects.

- **Section 5.C.1.b**: The Department of Transportation shall establish the number of trips for a project. When a project includes a use not listed in Appendix A or more than one use, then the Department shall use reasonable methods to establish the appropriate number of trips for that use.

- **Section 5.C.2:** Prior to the issuance of any building, grading, or foundation permit, the Department of Transportation shall determine that the applicant has submitted the application and paid the fee [based on the number of project-generated trips].

- **Section 5.D.3:** The Department of Transportation shall require that mitigation measures be undertaken or guaranteed to reduce the transportation impacts of a project.

- **Section 6.A.1:** Prior to the issuance of any building, grading, or foundation permit, an applicant shall pay or guarantee a Transportation Impact Assessment (TIA) Fee to the Department of Transportation. The TIA Fee shall be for the purpose of funding the transportation improvements listed in Appendix B of the Specific Plan.

SIGNIFICANCE CRITERIA

According to the CEQA Guidelines, a project may be deemed to have a significant effect on the environment if it would cause:

- An increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system;

- Hazards to safety from design features or incompatible uses;

- Inadequate emergency access or access to nearby uses; or

- Insufficient onsite or offsite parking capacity.

The *Coastal Transportation Corridor Specific Plan* exempts single-family dwelling projects from its standards. All other land uses must adhere to the significance criteria laid out in the Specific Plan. A transportation impact is measured either as an increase in the volume/capacity (v/c) ratio at an intersection, an impact on streets between intersections, or an increase in the number of average daily vehicles on a local residential street. The impact is determined by the Los Angeles Department of Transportation.

ENVIRONMENTAL IMPACTS AND MITIGATION

Impact J.1: Future development would add vehicle trips to local roadways. (Less than significant with recommended mitigation)

Previous traffic studies conducted in the project area evaluated traffic levels at major intersections. The most recent studies indicated that, with one exception, a.m. (morning) and p.m. (evening) peak-hour intersection levels of service (LOS) are generally LOS D or better (v/c ratio of 0.88 or lower). The exception is the intersection of Manchester Avenue / Lincoln Boulevard, which was found to operate at LOS E (v/c ratio of 0.91) during the p.m. peak hour.

It is assumed that the lots with residential zoning controls would be developed as single-family or multifamily housing, as appropriate to those zoning controls. For these lots, the estimated traffic generation is 334 trips per day (ITE, 1997). The future use on the one project lot in the PDR area that is zoned commercial has not been established. Assuming that the commercial use would be a specialty retail center (trip generation per 1,000-gross-square-foot area), estimated traffic generation is 488 trips per day, 31 during the p.m. peak hour (ITE, 1997). The estimated total traffic generation from development of the PDR and MDR lots is 822 trips per day. Construction on the project lots would also generate increased traffic on area roadways. However, those increases would be temporary and dispersed over the network of roadways serving the project area.

According to the *Coastal Transportation Corridor Specific Plan*, residential dwellings are exempt from its provisions. The Specific Plan applies only to commercial, manufacturing, and automobile parking zones. Thus, 35 of the 36 lots located in PDR and MDR would be exempt due to their residential zoning and the nature of the presumed development (i.e., residential dwellings).

The major roadway most likely to be used by residents to get in and out of the PDR project area is Manchester Avenue. Manchester Avenue is designated as a Major Highway–Class II and has an average capacity of 36,000 vehicles per day. The City of Los Angeles assesses changes in roadway levels of service on the basis of the percent increase in traffic volumes, with increasingly lower thresholds of percent increase depending on the prevailing (pre-project) level of service. For example, the impact threshold for roadways operating at LOS C is a project-generated 4 percent increase in roadway traffic volume; at LOS D is a 2 percent increase; and at LOS E is a 1 percent increase. Preliminary assessment of the trip-generating potential associated with the lots proposed for sale indicates a significant impact could occur if the one commercially zoned lot (Cluster 5) were developed with a traffic-intensive use.

Recommended Mitigation Measure J.1: A trip generation study shall be performed by the developer of the commercial property located in Cluster 5, in adherence with the City of Los Angeles Department of Transportation criteria. (Recommended for Future Development)

Significance after Recommended Mitigation: Less than significant.

Impact J.2: Future development project construction would result in temporary increases in truck traffic and construction worker traffic. (Less than significant with recommended mitigation)

Construction activities that would generate offsite traffic include the initial delivery of construction vehicles and equipment to the future development site, the daily arrival and departure of construction workers, the delivery of materials throughout the construction period, and removal of construction debris. Deliveries would include shipments of concrete, lumber, and other building materials for onsite structures, utilities (e.g., irrigation and plumbing equipment, electrical supplies), paving, and landscaping.

Construction-generated traffic would be temporary and intermittent and thus would not result in any long-term degradation in operating conditions on any project roadways. Construction-related traffic would lessen the capacities of project area streets because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles. However, given the proximity of the project site to major arterials (Manchester Avenue, Lincoln Boulevard, and Pershing Drive) and to regional freeways (I-10, I-405, and I-105), construction trucks would have relatively easy and direct routes. Most construction traffic would be dispersed throughout the day. Thus, the temporary increase would not significantly disrupt daily traffic flow on any of the project area roadways.

The 36 lots proposed for sale would be sold to several different entities or individual owners and are not likely to be developed simultaneously. However, for analysis purposes it was assumed that all of the lots would be developed at the same time, or at least within a short period of time. Under this development scenario, the project could have some adverse effects on traffic flow in the project area.

Recommended Mitigation Measure J.2: Construction contractors shall implement measures such as limiting the transport of construction materials and equipment to off-peak traffic periods, as required by the City of Los Angeles. (Recommended for Future Development)

Significance after Recommended Mitigation: Less than significant.

Impact J.3: Future development could increase interaction between motorists, bicyclists, and pedestrians. (Less than significant).

The future development on the lots proposed for sale would increase vehicle trips as well as pedestrian traffic in the project area, thus increasing the potential for interaction between these travel modes. However, the lots proposed for sale are in neighborhoods that have established circulation systems, and the future development would be designed to avoid conflicts between vehicles, pedestrians, and bicycles.

Mitigation: None required.

Impact J.4: Future development could result in inadequate emergency access for the 36 lots proposed for sale. (Less than significant)

The lots proposed for sale are located along major roadways. Based on site inspection of the 36 lots, the development of the lots proposed for sale would not block emergency access or disturb traffic patterns. Therefore, the impact of future development would be less than significant.

Mitigation: None required.

Impact J.5: Future development would generate the need for onsite parking. (Less than significant with recommended mitigation)

The residential developments surrounding the MDR and PDR lots contain designated parking areas. Assuming the residential lots proposed for development would comply with the Municipal Code, which requires two parking spaces per dwelling unit, the parking demand associated with the new houses would be satisfied by onsite parking. A significant impact could occur if the one commercially zoned lot did not supply sufficient onsite parking. Commercially zoned property is required by the Municipal Code to have two parking spaces for every 1,000 square feet. Assuming the development of a 12,000-square-foot building, 24 parking spaces would be required.

Recommended Mitigation Measure J.5: The developer of the commercial property shall provide adequate onsite parking, in accordance with the City of Los Angeles Municipal Code requirements. (Recommended for Future Development)

Significance after Recommended Mitigation: Less than significant.

CUMULATIVE IMPACTS

Impact J.6: In combination with other development projects in the area, future development would add vehicle trips to local roadways. (Less than significant with recommended mitigation)

Future owners of the surface rights would be assumed to develop the lots. All development would occur in accordance with local policy and would be subject to review by the City and County of Los Angeles. The 36 undeveloped lots would be sold to several different entities or individual owners and would not likely be developed simultaneously. However, for analysis

purposes it was assumed that all of the lots would be developed at the same time, or at least within a short period of time.

As described under Impact J.1, it is assumed that the lots with residential zoning controls would be developed as single-family or multifamily housing, as appropriate to those zoning controls, and that the future use on the one project lot in the PDR area that is zoned commercial would be (for purposes of this EIR) specialty retail center. The estimated total traffic generation from development of the PDR and MDR lots is 822 trips per day.

According to the *Coastal Transportation Corridor Specific Plan*, residential dwellings are exempt from its provisions. The Specific Plan applies only to commercial, manufacturing, and automobile parking zones. Thus, 35 of the 36 lots located in PDR and MDR would be exempt due to their residential zoning and the nature of the presumed development (i.e., residential dwellings).

The City of Los Angeles assesses changes in roadway levels of service on the basis of the percent increase in traffic volumes, with increasingly lower thresholds of percent increase depending on the prevailing (pre-project) level of service. For example, the impact threshold for roadways operating at LOS C is a project-generated 4 percent increase in roadway traffic volume; at LOS D is a 2 percent increase; and at LOS E is a 1 percent increase. Preliminary assessment of the trip-generating potential associated with the project lots indicates that the contribution to the trip generation of the future development of the commercially zoned lot could be cumulatively considerable.

Recommended Mitigation Measure J.6: Implement Mitigation Measure J.1. (Recommended for Future Development)

Significance after Recommended Mitigation: Less than significant.

REFERENCES – Transportation and Traffic

City of Los Angeles, *Coastal Transportation Corridor Specific Plan*, Ordinance No. 168,999, September 22, 1993.

Institute of Transportation Engineers (ITE), *Trip Generation* (6th Edition), 1997.

K. UTILITIES AND SERVICE SYSTEMS

ENVIRONMENTAL SETTING

WATER

Water Supply

The Los Angeles Department of Water and Power (LADWP) provides potable water for the City of Los Angeles, including the project area. Water service is currently available to the lots to be sold in PDR and MDR. According to LADWP's *Urban Water Management Plan 2001–2002 Annual Update*, the LADWP supplied approximately 680,000 acre-feet (acre-ft) of water to its customers during fiscal year 2002 (July 1, 2001 through June 30, 2002). LADWP currently receives its water supply from the Los Angeles Aqueducts (228,396 acre-ft for fiscal year 2002), local groundwater (73,387 acre-ft for fiscal year 2002), and from the Metropolitan Water District of Southern California (MWDSC) (372,357 acre-ft for fiscal year 2002). These supplies were adequate to meet the city's water demand during fiscal year 2002 (LADWP, 2002).

Water Conservation

In addition to water supply, the *Urban Water Management Plan* discusses water demand management. LADWP operates a water conservation program that results in a demand reduction of approximately 15 percent. In addition, recycled water is used in the city to meet irrigation, commercial, and industrial demands, where feasible. LADWP also submitted a proposal to MWDSC in June 2002 for construction of a seawater desalination facility. Lessons learned from droughts have informed LADWP's philosophy for handling water shortages. In the event of future shortages, LADWP intends to use pricing structures to complement an aggressive conservation program to balance supply and demand (LADWP, 2000).

To support the statewide conservation effort, LADWP has been active in the California Urban Water Conservation Council (CUWCC). The CUWCC monitors implementation of conservation measures, such as the 14 best management practices (BMPs) established in the *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU). LADWP was one of the original signatories of the MOU and is fully compliant with all applicable BMPs outlined in the MOU (LADWP, 2000).

WASTEWATER

The City of Los Angeles Department of Public Works, Bureau of Sanitation provides sewer conveyance infrastructure and wastewater treatment services to the city of Los Angeles. The Bureau of Sanitation provides planning and financial management and maintains and operates the wastewater collection and treatment system. The Bureau of Engineering provides design and construction engineering. The wastewater system in the PDR and MDR area includes a wastewater collection system and the Hyperion Wastewater Treatment Plant; treated effluent is discharged to Santa Monica Bay. The wastewater collection system serving Los Angeles consists

of about 6,000 miles of pipe, and about 150 miles of outfall sewers and major interceptors. The interceptor sewer line in the project area is in the North Outfall Sewer, and is one of the four major interceptor sewers used to convey wastewater to the Hyperion Treatment Plant. The Hyperion service area covers approximately 515 square miles and services the majority of the Los Angeles population. The Hyperion Treatment Plant, the City's largest facility, serves more than two-thirds of Los Angeles and has a capacity to process 450 million gallons per day (mgd), with 100 percent secondary treatment. The plant currently receives an average flow of approximately 350 mgd. Peak wet-weather flows up to 1,000 mgd can be handled for short periods (Los Angeles Bureau of Sanitation, 2001a). Several collection system improvements are currently in underway to accommodate anticipated growth through the year 2010.

The Hyperion Treatment Plant receives an average flow of 360 mgd and has an excess capacity of approximately 90 mgd. In addition, peak wet-weather flows up to 1,000 mgd can be handled for short periods (Los Angeles Bureau of Sanitation, 2001a).

STORMWATER

The project site is located in a highly developed area with established stormwater drainage facilities. For more information, see Section IV.F, *Hydrology and Water Quality*.

SOLID WASTE

The Los Angeles County Department of Public Works, Bureau of Sanitation disposes of the refuse it collects into three primary landfills, two operated by private entities and one by the Los Angeles County Sanitation Districts: the Bradley Landfill, owned and operated by Waste Management, Inc.; the Sunshine Canyon Landfill, owned and operated by Browning Ferris Industries; and the Calabasas Landfill operated by the Bureau of Sanitation. Approximately 94 percent of Los Angeles's solid waste is disposed of in landfills within Los Angeles County. According to the California Integrated Waste Management Board's (CIWMB) wastestream profiles, the Bradley Landfill is expected to reach capacity by 2007; the Sunshine Canyon Landfill by 2011; and the Calabasas Landfill by 2028 (CIWMB, 2004). In addition, the Bureau of Sanitation contracts with several privately owned and operated material recovery facilities that receive, clean, process, and market recyclables. The Bureau of Sanitation also has three city operations and several private contractors that accept, clean, grind, and mulch or compost yard trimmings.

Solid waste collection and disposal in Los Angeles is carried out by both public and private refuse collection services and solid waste disposal facilities. The City developed a strong waste management infrastructure including a myriad of reduction, recycling, composting, and reuse programs.

APPLICABLE REGULATIONS, PLANS, AND POLICIES STATE

Assembly Bill 939

The California Integrated Waste Management Act of 1989, or Assembly Bill 939 (AB 939), required the Source Reduction and Recycling Element of each city and county to include an implementation schedule to meet diversion goals of 25 percent by 1995 and 50 percent by 2000 through source reduction, recycling, and composting activities. The City has surpassed the state-mandated 50 percent diversion rate, and for the year 2000 achieved a 58.8 percent diversion rate (Los Angeles Bureau of Sanitation, 2001b).

LOCAL

Los Angeles Bureau of Sanitation, Solid Resources Citywide Recycling Division

The Solid Resources Citywide Recycling Division was formed in mid-1998 to develop and implement effective and economically feasible source reduction, recycling, buy-recycled, and reuse programs, activities, and policies. These goals are accomplished through technical assistance provided to business, industry, governmental agencies, and various community groups seeking to increase responsible waste management, along with outreach programs, educational programs, public events, workshops, and seminars (Los Angeles Bureau of Sanitation, 2004).

Los Angeles Department of Water and Power

The LADWP, the largest municipal utility in the nation, was established over 100 years ago to deliver reliable and safe water and electricity supplies. The LADWP services approximately 3.8 million residents and businesses in Los Angeles. A five-member Board of Water and Power Commissioners establishes policy for LADWP. The Board members are appointed by the mayor and confirmed by the city council for five-year terms (LADWP, 2004).

Los Angeles Department of Public Works, Bureau of Sanitation

The Bureau of Sanitation is the primary department responsible for the collection, transport, and disposal of stormwater; collection, transport, treatment, reuse, and disposal of wastewater from Los Angeles, some county areas, and nine other cities; the citywide plan for a 50 percent reduction in solid waste disposal, in accordance with AB 939; and collection of recyclables, yard trimmings, and refuse from 720,000 households and dead animals citywide.

The Bureau's mission is "to protect the public and environment through legal, efficient, and effective collection, treatment, reuse and disposal of liquid and solid wastes while enhancing relationships with the community, coworkers, elected and appointed officials, and business" (Los Angeles Bureau of Sanitation, 2004).

Los Angeles Department of Water and Power Urban Water Management Plan

The California Urban Water Management Planning Act (California Water Code, Division 6, Part 2.6, Sections 10610–0656) requires water suppliers to develop water management plans every five years to identify short-term and long-term water demand management measures to meet

growing water demands during normal, dry, and multiple-dry years. The plan includes the following:

- A description of existing and planned sources of water available to the water supplier
- Conservation efforts to reduce water demand
- Alternative sources of water
- Assessment of reliability and vulnerability of the water supply
- Water shortage contingency analysis

Details of LADWP's efforts to promote the efficient use and management of its water resources are contained in its *Urban Water Management Plan*. The next water plan is scheduled for release in 2005.

Los Angeles City-Collected Refuse Disposal Plan

The City-Collected Refuse Disposal Plan is an element of the Los Angeles General Plan. While the City is currently drafting an Infrastructure Element to its General Plan, the Refuse Disposal Plan, adopted in 1972, is the most recent information available. The objectives of the plan include:

- Providing a basis for the use and acquisition of existing and future landfill sites necessary for the disposal of refuse in order to maintain a clean and healthful environment
- Serving as a guide to meet or exceed city, county, and state refuse disposal requirements in the acquisition, maintenance, and operation of existing and future landfill sites
- Providing a basis for the review and adjustment of the plan made necessary by changing land use and new technologies
- Providing a basis for the site acquisition program to meet future needs, considering proximity to collection areas and proposed uses for the reclaimed land
- Considering waste material as a city resource in the reclamation of land to its optimum potential use

Los Angeles Water System Plan

The Water System Plan is an element of the Los Angeles Master Plan. While the City is currently drafting an Infrastructure Element to its General Plan, the Water System Plan, adopted in 1969, is the most recent information available. The objectives of the plan include:

- Identifying the needs for land and facilities necessary to provide an adequate and reliable water supply throughout the city of Los Angeles and to designate general locations for such facilities
- Introducing and utilizing new technologies for the improvement of the water system in order to meet the ever increasing demand for water at the most economical rates possible

- Periodically re-evaluating the capability of the water system facilities in order to reflect changes in the demand for water resulting from technological developments and new patterns in the city's land use
- Providing water pressure and supply necessary for normal domestic needs and for efficient fire protection.
- Setting forth design standards for the water system relating to the total water demand and available of supply, number and size of facilities, and to assure construction of facilities to be aesthetically compatible with adjacent lands and developments

Los Angeles Sewerage Plan

The Sewerage Plan is an element of the Los Angeles Master Plan. While the City is currently drafting an Infrastructure Element to its General Plan, the Sewerage Plan, adopted in 1968, is the most recent information available. The objectives of the plan include:

- Providing a basis for the development of a safe, efficient, and economical sewerage system for the city of Los Angeles
- Utilizing the best current estimates of future land use in the areas to be served as a basis for determining quantitative requirements for sewerage facilities
- Establishing criteria for the location, design, and installation of sewerage facilities that will minimize odor and unsightliness
- Describing standards followed in formulating this modern sewerage plan
- Providing a basis for the improvement of existing facilities, the development of proposed facilities, and the accommodation of future technical improvements and alternative concepts of city development
- Recognizing that the system should not be limited by political boundaries
- Recognizing that water and other by-products of the system may have economic value for the city

SIGNIFICANCE CRITERIA

According to Appendix G of the CEQA Guidelines, a project would have a significant effect on the environment with respect to utilities and service systems if it would:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

- Have insufficient water supplies available to serve the project from existing entitlements and resources;
- Result in a determination by the wastewater treatment provider which serves or may serve the project site that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments; or
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs.

ENVIRONMENTAL IMPACTS AND MITIGATION

Development of all 36 lots in PDR and MDR is projected to increase the population of Los Angeles by less than one hundredth of one percent. Development of the lots under consideration would be subject to all policies of the City and County of Los Angeles, and a determination of impacts would be made as individual applications are submitted. As stated in the Initial Study, due to the infill nature of development of these lots, and the existing availability of services to the area, adverse impacts to utilities and service systems would not be expected.

Impact K.1: Future development would require additional domestic water service from LADWP. (Less than significant)

The proposed sale could result in the subsequent development of approximately 80 residential units, which are projected to house approximately 175 people, specifically analyzed in the *Population and Housing* Section of the Initial Study (Appendix A). This development would require additional domestic water service from LADWP. Assuming water usage at a rate of approximately 175 gallons per person per day, the proposed sale is projected to generate demand for approximately 30,500 gallons of water per day. According to LADWP's *Urban Water Management Plan*, LADWP has met the immediate water needs of its customers and is well-positioned to do so in the future. However, LADWP will continue to rely upon its investments in MWDSC to meet future needs that exceed its own water resources (LADWP, 2002). LADWP has indicated that it has a responsibility to and will provide domestic water to reasonably foreseeable development at the 36 lots in PDR and MDR (Bautista, 2004). Because, LADWP would be able to provide domestic water service to the project lots, this would be a less than-significant-impact.

Mitigation: None required.

Impact K.2: Future development would decrease the excess wastewater capacity of the Los Angeles Department of Public Works, Bureau of Sanitation. (Less than significant)

The Los Angeles Bureau of Sanitation uses 200 gpd per three bedroom single-family home to project wastewater usage. Using the anticipated future maximum development that consists of approximately 80 new residential units, it is estimated that approximately 16,000 gpd of

additional wastewater would be generated from the future development of the 36 lots proposed for sale. This additional wastewater would represent approximately 0.0002 percent of the excess capacity at the Hyperion Treatment Plant, and only 0.00005 percent of the average flow currently received. The Bureau of Sanitation does not expect the future development of the 36 lots proposed for sale to have an impact on the local sewer lines and the treatment facility (Hagekhalil, 2004). Therefore, project-related impacts to the wastewater capacity of the Bureau of Sanitation would be less than significant.

Mitigation: None required.

Impact K.3: Future development would generate solid waste. (Less than significant)

The proposed sale could result in the development of up to approximately 80 residential units, which could accommodate approximately 175 persons. According to the CIWMB's Wastestream Profile for Los Angeles, the average household disposal rate is approximately 1.3 pounds per resident per day. Using this rate, the proposed sale could result in the disposal of approximately 80,000 pounds of solid waste per year. Total household waste disposal in 2000 in Los Angeles was 906,541 tons. Therefore, the reasonably foreseeable development of approximately 80 residential units would result in the generation of less than 0.00005 percent of all household solid waste in Los Angeles. The City has surpassed the state-mandated 50 percent diversion rate, and for the year 2000 achieved a 58.8 percent diversion rate (Los Angeles Bureau of Sanitation, 2001b). Solid Resources Citywide Recycling Division develops and implements effective and cost-effective source reduction, recycling, and reuse programs and policies to ensure that Los Angeles continues to meet its required diversion rate.

According to CIWMB's wastestream profiles, the Bradley Landfill is expected to reach capacity by 2007; the Sunshine Canyon Landfill by 2011; and the Calabasas Landfill by 2028 (CIWMB, 2004). Therefore, there would be sufficient landfill capacity to serve the future development of the lots.

Mitigation: None required.

CUMULATIVE IMPACTS

Impact K.4: The future development of the 36 lots proposed for sale would cumulatively, with other cumulative projects in the area (as described in Section 3.6), increase demand for water from LADWP, decrease the excess capacity of the Hyperion Treatment Plant, and increase the generation of solid waste. (Less than significant)

The LADWP has indicated that it has a responsibility to and will provide domestic water to reasonably foreseeable development at the 36 lots in PDR and MDR (Bautista, 2004). Because

all new development would be subject to the Department's regulations at the time of application for service, this would be a less-than-significant impact. According to LADWP's *Urban Water Management Plan*, LADWP has met the immediate water needs of its customers and is well-positioned to do so in the future. In addition, because the project lots would be developed in accordance with their current land use and zoning designations, development in Los Angeles has been accounted for within LADWP's planning assumptions.

The Hyperion Treatment Plant's capacity is approximately 450 mgd; flow is currently at approximately 360 mgd, with sufficient capacity for the wastewater flows of future development. Several collection system improvements are currently underway to accommodate anticipated growth through 2010. The project's contribution to wastewater flows at the Treatment Plant would only represent approximately 0.03 percent of the excess capacity at the Hyperion Treatment Plant, and only 0.008 percent of the average flow currently received. Therefore, the project's contribution to the Hyperion Treatment Plant's wastewater flows would be less than significant.

The City has surpassed the state-mandated 50 percent diversion rate, and for the year 2000 achieved a 58.8 percent diversion rate (Los Angeles Bureau of Sanitation, 2001b). Solid Resources Citywide Recycling Division develops and implements effective and cost-effective source reduction, recycling, and reuse programs and policies to ensure that Los Angeles continues to meet its required diversion rate. In addition, according to CIWMB's wastestream profiles, the Bradley Landfill is expected to reach capacity by 2007; the Sunshine Canyon Landfill by 2011; and the Calabasas Landfill by 2028 (CIWMB, 2004). Therefore, there would be sufficient landfill capacity to serve the future development of the lots and the project's contribution to solid waste impacts would not be cumulatively considerable.

Mitigation: None required.

REFERENCES – Utilities and Service Systems

Bautista, Alvin, Water Resources Engineer, Los Angeles Department of Water and Power, personal communication, January 21, 2004.

California Integrated Waste Management Board (CIWMB), *California Waste Stream Profiles*, www.ciwmb.ca.gov/Profiles/Facility/Landfill, accessed February 25, 2004.

California Integrated Waste Management Board (CIWMB), *Jurisdiction Profile for City of Los Angeles*, www.ciwmb.ca.gov/Profiles/Juris/JurProfile1.asp?RG=C&JURID=272&JUR=Los+Angeles, accessed January 9, 2004.

Hagekhalil, Adel, Division Manager, Wastewater Engineering Services Division, Los Angeles Bureau of Sanitation, written communication, March 25, 2004.

Los Angeles Department of City Planning and the Bureau of Sanitation, *City-Collected Refuse Disposal Plan, an Element of the General Plan of the City of Los Angeles*, 1972.

Los Angeles Department of City Planning and the Department of Public Works, *Sewerage Plan, an Element of the Master Plan of the City Los Angeles*, 1968.

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Los Angeles Department of Public Works, Bureau of Sanitation, *Decade of Progress Wastewater Program*, 2001a.

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CHAPTER 5

ALTERNATIVES

5.1 ALTERNATIVES DEVELOPMENT AND SCREENING PROCESS

CEQA requires an evaluation of the comparative effects of a range of reasonable alternatives to the project that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project (*CEQA Guidelines* Section 15126.6(a)). The range of alternatives is governed by the "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice (Section 15126.6(f)). Evaluation of a No Project Alternative and identification of an environmentally superior alternative is required. The significant effects of the alternatives shall be discussed, but in less detail than the significant effects of the proposed project (Section 15126.6(d)).

This chapter discusses the following alternatives to the proposed sale: 1) No Project Alternative; 2) Partial Sale – Exclude Cluster 9 Alternative; and 3) Partial Sale – Exclude Cluster 12 Alternative. The components of these alternatives are described below, including a discussion of their impacts and how they would differ from those under the proposed sale.

CEQA Guidelines require that an EIR briefly describe the rationale for selecting the alternatives to be discussed (Section 15126.6(a)), and suggest that an EIR also identify any alternatives that were considered by the lead agency but were rejected as infeasible (Section 15126.6(c)). This chapter of the EIR also addresses these issues.

Of the alternatives assessed in this EIR, the alternative with the least environmental impact would be the No Project Alternative. Section 15126.6(e)(2) of the CEQA Guidelines states that if the environmentally superior alternative is the no project alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. Among the other alternatives, Alternatives 2 and 3 (Partial Sale - Exclusion of Cluster 9 and/or 12) are the environmentally superior alternatives.

5.2 ALTERNATIVES SCREENING METHODOLOGY

The alternatives addressed in this EIR were selected in consideration of one or more of the following factors:

- the extent to which the alternative would accomplish most of the basic objectives of the project (see "Project Goals and Objectives" in Chapter 3);
- the extent to which the alternative would avoid or lessen any of the identified significant adverse environmental effects of the project;

- the feasibility of the alternative, taking into account site suitability, economic viability, availability of infrastructure, consistency with regulatory limitations, and the reasonability of the project sponsor's acquiring or controlling the site;
- the appropriateness of the alternative in contributing to a "reasonable range" of alternatives necessary to permit a reasoned choice; and
- the requirement of CEQA Guidelines to consider a "no project" alternative as well as an "environmentally superior" alternative (CEQA Guidelines, Section 15126.6).

In consideration of the above factors, three alternatives were selected to be addressed in this EIR. Each of these alternatives is described below, together with the basis for its selection.

5.3 DESCRIPTIONS OF ALTERNATIVES CONSIDERED

ALTERNATIVE 1: No Project

DESCRIPTION

Under the No Project Alternative, the lots proposed for sale by SCG would not be sold. As none of the lots would be sold, the future connected action that would result from the sale of the lots (residential and some commercial development) would also not occur. SCG would maintain ownership of the 36 lots; the site characteristics of which would remain in their existing condition, as described in Chapter 3, Project Description, and in the setting sections of Chapter 4 of this EIR. SCG would continue to conduct on-going maintenance activities to maintain the abandoned wells.

BASIS FOR SELECTION

The No Project Alternative is included in this EIR because *CEQA Guidelines*, Section 15126.6(e)(1), requires that an EIR evaluate a "no project" alternative along with its impact in order to provide a comparison of the impacts of approving the proposed sale with the impacts of not approving the proposed sale. Pursuant to *CEQA Guidelines*, Section 15126.6(e)(3)(B), the No Project Alternative discusses "the property remaining in its existing state."

DISTINCTIVE ENVIRONMENTAL CHARACTERISTICS

The following summarizes potential impacts of the "No Project" alternative and compares them to the impacts of the proposed sale. If the alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative are discussed.

Air Quality

No change in air emissions, other than those changes due to emissions from cumulative projects, would occur. The No Project Alternative would avoid potential impacts from emissions such as diesel particulate matter from construction equipment. The No Project Alternative would also avoid air quality impacts that would result from onsite operational emissions, such as combustion of natural gas and operation of mobile sources. This alternative would avoid potential air quality impacts related to the construction of the lots proposed for sale.

Biological Resources

No construction would occur and therefore, potential impacts to special status raptors and other avian species would not exist. The No Project Alternative would avoid potential biological impacts to the monarch butterfly and globose dune beetle related to construction and occupancy of the lots proposed for sale.

Cultural Resources

No construction or change in present site conditions would occur under this alternative. The impacts would be essentially the same as existing conditions. As a result, the No Project Alternative would avoid potential impacts to cultural resources related to the development of the lots proposed for sale.

Geology and Soils

Other than cumulative projects, no construction would occur under this alternative. No change in geologic conditions would occur. Therefore, the No Project Alternative would avoid potential geologic impacts related to the development of the lots proposed for sale.

Public Health

Impacts to public health would remain the same as under existing conditions. The No Project Alternative would avoid potential impacts from exposure to contaminants that may be contained in the soil during excavation and occupation activities. The No Project Alternative would avoid potential public health impacts related to the development of the lots proposed for sale.

Public Safety

No construction or change in present site conditions would occur under this alternative. The impacts would be essentially the same as under existing conditions. Therefore, The No Project Alternative would avoid potential public safety impacts related to the development of the lots proposed for sale.

Hydrology and Water Quality

The impacts would be essentially the same as under existing conditions. The potential increase in stormwater runoff resulting from construction activities or changes in drainage patterns would not

occur. Therefore, the No Project Alternative would avoid potential hydrology and water quality impacts related to the development of the lots proposed for sale.

Noise

The impacts would be essentially the same as under existing conditions. As a result, the No Project Alternative would avoid the addition of potential noise impacts related to the development of the lots proposed for sale.

Transportation and Traffic

Because no new construction would occur at the site, the No Project Alternative would result neither in a temporary nor long-term increase in vehicle trip generation over existing conditions. As such, the No Project Alternative would not increase project traffic volumes on local roadways. Moreover, this alternative would avoid any potential impacts (albeit less than significant) associated with traffic intrusion into adjacent neighborhoods.

Utilities and Service Systems

The No Project Alternative would avoid the potential impacts related to additional domestic water demand from LADWP, wastewater capacity at the Hyperion Treatment Plant, and solid waste generation. As a result, the No Project Alternative would avoid the potential utilities and service systems impacts related to the development of the lots proposed for sale.

ALTERNATIVE 2: Partial Sale – Exclusion of Cluster 9

DESCRIPTION

Under the Partial Sale Alternative – Exclusion of Cluster 9, potential adverse impacts to the monarch butterfly would be avoided. Under this alternative, the CPUC would authorize the sale of all of the lots proposed for sale except the lots contained in Cluster 9. The lots in Cluster 9 would remain in their existing conditions, as described in Chapter 3, Project Description, and in the setting sections of Chapter 4 of this EIR. This alternative is analyzed to include reasonably foreseeable development on the project lots; however, future development would not occur on the lots in Cluster 9.

BASIS FOR SELECTION

The Partial Sale Alternative is included in this EIR to provide a basis for comparing the affects of a partial sale to the proposed sale of all the lots. This alternative may, for example, reduce potentially significant impacts to biological resources, namely the monarch butterfly on Cluster 9.

DISTINCTIVE ENVIRONMENTAL CHARACTERISTICS

Similar to the proposed sale, Alternative 2, Exclusion of Cluster 9 would avoid potential impacts to the monarch butterfly in Cluster 9. Mitigation measures proposed for the project could

mitigate these potential impacts to globose dune beetle habitat. Impacts to biological resources under Alternative 2 would be less than under the proposed sale because monarch butterfly habitat would remain undisturbed.

As development of the lots would be reduced under this alternative, impacts to all other environmental areas would be slightly less than under the proposed sale.

ALTERNATIVE 3: Partial Sale – Exclusion of Cluster 12

DESCRIPTION

Under the Partial Sale Alternative – Exclusion of Cluster 12, potential adverse impacts to the globose dune beetle would be avoided. Under this alternative, the CPUC would authorize the sale of all of the lots proposed for sale except the lots contained in Cluster 12. The lots in Cluster 12 would remain in their existing conditions, as described in Chapter 3, Project Description, and in the setting sections of Chapter 4 of this EIR. This alternative is analyzed to include reasonably foreseeable development on the project lots; however, future development would not occur on the lots in Cluster 12.

BASIS FOR SELECTION

The Partial Sale Alternative is included in this EIR to provide a basis for comparing the affects of a partial sale to the proposed sale of all the lots. This alternative may, for example, reduce potentially significant impacts to biological resources, namely the globose dune beetle in Cluster 12.

DISTINCTIVE ENVIRONMENTAL CHARACTERISTICS

Similar to the proposed sale, Alternative 3, Exclusion of Cluster 12 from the proposed sale, would result in potential disturbance to the monarch butterfly because this option would include the sale and development of Cluster 9. However, this alternative would avoid potential impacts to the globose dune beetle in Cluster 12. Mitigation measures proposed for the project could mitigate these potential impacts to the monarch butterfly. Impacts to biological resources under Alternative 3 would be less than under the proposed sale because the globose dune beetle would remain undisturbed.

As development of the lots would be reduced under this alternative, impacts to all other environmental areas would be slightly less than under the proposed sale.

5.4 ALTERNATIVES CONSIDERED BUT REJECTED AS INFEASIBLE

CEQA Guidelines Section 15126.6 (c) states that the “EIR should …identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency’s determination.” This section of the

Guidelines goes on to state "among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts."

One alternative was considered but eliminated from this analysis. Under this alternative, SCG would have maintained ownership of the lots proposed for sale and the lots would have been developed as parks or common areas. While, this alternative was considered, it was rejected because it did not meet any of the project objectives of divestiture of SCG's assets. Additionally, development of the lots for use as parks or common areas would have resulted in increased public access that could result in additional environmental impacts. For example, this alternative could result in less control of disturbances to biological resources on some of the lot (as described in Section 4.C, *Biological Resources* and Alternatives 2 and 3 above). Therefore, this alternative was eliminated from consideration.

CHAPTER 6

OTHER CEQA CONSIDERATIONS

6.1 SIGNIFICANT UNAVOIDABLE ENVIRONMENTAL IMPACTS

CEQA Guidelines Section 15126.2(c) and 15126(d) require that an EIR identify significant environmental effects which cannot be avoided and significant irreversible environmental changes that would be caused by the proposed sale.

The proposed sale would not have any significant and unavoidable environmental impacts. For all other significant impacts associated with future development of the lots proposed for sale, recommended mitigation measures have been identified that, when development occurs, would mitigate those impacts to a less-than-significant level.

6.2 GROWTH INDUCEMENT

The CEQA requires a discussion of the ways in which a proposed project could result in growth inducement. CEQA Guidelines 15126.2 (d) identifies a project to be growth-inducing if it fosters economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment. New employees hired for proposed commercial and industrial development projects and population growth resulting from residential development projects represent direct forms of growth. Other examples of projects that are growth-inducing are the expansion of urban services into a previously un-served or under-served area, the creation or extension of transportation links, or the removal of major obstacles to growth. It is important to note that these direct forms of growth have secondary effects of expanding the size of local markets and attracting additional economic activity to the area.

Typically, the growth-inducing potential of a project would be considered significant if it would stimulate human population growth or a population concentration above what is assumed in local and regional land use plans, or in projections made by regional planning authorities. Significant growth impacts could also occur if the project provides infrastructure or service capacity to accommodate growth levels beyond those permitted by local or regional plans and policies.

The project would result in an estimated 175 additional persons residing in the project area when the 36 lots proposed for sale are developed. The effects of this anticipated growth are specifically analyzed in the *Population and Housing* Section of the Initial Study (Appendix A). Because the lots are located in an already built-out area, future development on the lots would be considered infill development that would not induce substantial growth in the project area.

6.3 CUMULATIVE IMPACTS SUMMARY

CEQA Guidelines 15130 requires an EIR to include an analysis of cumulative impacts when the project's incremental effect is cumulatively considerable. As defined in CEQA Guidelines 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. In general, and as defined in CEQA Guidelines 15130, CEQA requires that:

- Cumulative impacts be discussed when they may be significant;
- The discussion may be more general than that for the individual project impacts, but that the discussion should reflect the potential extent, severity, and probability of the impact;
- The cumulative impact analysis can be based on a list of reasonably foreseeable projects or projections from a General Plan or a regional planning agency; and,
- Reasonable options for mitigating or avoiding any significant cumulative impacts be proposed, noting that for some cumulative impacts the only feasible mitigation may involve the adoption of ordinances or regulations rather than the imposition of conditions on a project-by-project basis.

The key characteristics of a cumulative impact analysis are:

- A project impact (significant or not), plus
- Impacts from other projects of the same type as that of the project

  The interaction of these impacts to create a cumulative impact affecting the same geographic unit of analysis as that of the proposed project.

The cumulative impact analyses in this document are based on a cumulative growth scenario that incorporates buildout under the existing City of Los Angeles General Plan, as well as reasonably foreseeable future development projects that are of the same type as the proposed project and/or are located in the immediate vicinity of the proposed project at the time of publication of the Notice of Preparation (NOP) that include the following:

- **Village at Playa Vista** – A single-family subdivision in the Westchester–Playa del Rey Community Plan Area. This project, located about one mile north of the PDR lots proposed for sale, is currently under review by the City of Los Angeles. The project consists of the following two components: (1) a mixed-use community, and (2) a 6.7-acre riparian corridor and restoration/maintenance of a portion of the Westchester Bluffs adjacent to the riparian corridor. The project involves urban development on 99.3 acres and habitat creation/restoration on 11.7 acres.
- **Mountain Gate** – A single-family subdivision in the Westchester–Playa del Rey Community Plan Area located approximately ten miles north of MDR. This project is currently under review by the City of Los Angeles.
- **Westchester Community Plan Update** – Refinement of the existing 1996 General Plan Framework Element to guide development through 2025. The City of Los Angeles identified potential impacts in the following areas: geology, air quality, noise, land use,

transportation, public services, utilities, recreation, and population, employment, and housing. The 36 lots proposed for sale are included within the Community Planning area. This plan update is currently under review by the City of Los Angeles.

- **Palisades Landmark Condominium Project** – Located within the Brentwood - Pacific Palisades Community Plan Area, this project consists of 20 apartment units in two buildings, construction of 25-story townhouses (3,000 square feet), and 57 four-story condos, on approximately four acres of hillside terrain. This project, located approximately nine miles north of the MDR lots, is currently under review by the City of Los Angeles.

- **Brentwood Project "The Park"** – This project consists of 54,700 square feet of commercial uses in the Brentwood–Pacific Palisades Community Plan Area. This project, located about seven miles north of MDR, has already been approved by the City of Los Angeles.

- **Westside Medical Park** – Medical facilities consisting of the demolition of four buildings (226,368 square feet), construction of three medical offices (535,000 square feet), and a 215,000 square-foot specialty surgical hospital on an 11.5-acre lot. The project, located near the intersection of Bundy Drive and West Olympic Boulevard (about five miles northeast of MDR), is currently under review by the City of Los Angeles.

It should be noted that since the publication of the NOP on September 2, 2003, some of these projects may have changed or new projects may have been applied for. The analysis for the proposed sale in this document considers only those project listed above as defined at the time of NOP publication as required by CEQA.

Each topical analysis presented in Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*, of this report considers possible cumulative impacts related to the discussion. Cumulative impacts on Transportation and Traffic are identified in Chapter 4 of this EIR.

6.4 EFFECTS FOUND NOT TO BE SIGNIFICANT

The environmental effects of the proposed sale are identified and discussed in detail in Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*. The transfer of property ownership of the 36 PDR and MDR lots from SCG to new owners, would not result in any direct significant environmental impacts. All identified environmental effects of future development on the 36 lots proposed for sale would be less than significant after implementation of the identified recommended mitigation measures. Impacts found to be less than significant in the Initial Study (see Appendix A) included Aesthetics, Agricultural Resources, Energy, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, and Recreation.

CHAPTER 7

REPORT PREPARATION AND PUBLIC PARTICIPATION

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CHAPTER 8

GLOSSARY AND ACRONYMS

8.1 GLOSSARY

ADVERSE: A term used to describe unfavorable, harmful, or detrimental changes in environmental conditions.

ALTERNATIVES: Other feasible projects that meet of substantially meet the stated objectives of the project being reviewed.

ARTIFACTUAL: Of or relating to artifacts.

ATLATL: A wooden device with a handle at one end and at the other a hook or spur that fits into a concavity at the proximal end of a dart shaft.

A-WEIGHTED DECIBEL (dBA): Decibels with the sound pressure scale adjusted to conform with the frequency response of the human ear. A sound level meter that measures A-weighted decibels has an electrical circuit that allows the meter to have the same sensitivity to sound at different frequencies as the average human ear.

BEST MANAGEMENT PRACTICES: Methods that have been determined to be the most effective, practical means of preventing or reducing pollution from non-point sources.

BREAS: Seeps of natural petroleum that trapped extinct animals and preserved and fossilized their remains.

BIOGENIC GAS: Biogenic gas is primarily methane with carbon dioxide and sulfide gases that result from decomposition of organic material in former lagoon deposits or other sources.

CUMULATIVE IMPACT: Two or more environmental effects which, when considered together, area considerable or which compound or increase other environmental impacts.

DECIBEL (dB):	A unit for expressing the relative intensity (loudness) of sounds. The decibel is the logarithm of the ratio of the intensity of a given sound to the faintest sound discernable by the human ear.
DIURNAL:	Of, relating to, or occurring in the daytime.
ECOFACTUAL:	Pertaining to plant and animal remains.
EFFLUENT:	Wastewater--treated or untreated--that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.
ENDANGERED SPECIES:	Under the California Endangered Species Act, a species of plant, fish, or wildlife, which is "in serious danger of becoming extinct throughout all, or a significant portion of its range" and is limited to species or subspecies native to California. Under the Federal Endangered Species Act, an endangered species is defined as "any species that is in danger of becoming extinct throughout all or a significant portion of its range."
ENVIRONMENT:	The physical conditions which exist within an area which will be affected by a proposed project. The conditions include land, air, water, minerals, flora, fauna, noise, and objects of historical or aesthetic significance.
EROSION:	Process by which material is removed from the earth's surface (including: weathering, dissolution, abrasion, and transportation).
ESTUARY:	A region where fresh water from a river mixes with salt water from the sea.
FEASIBLE:	Capable of successfully being accomplished by reasonably available means.
GEOFACTUAL:	Pertaining to soils, sediments, and minerals.
GROUNDWATER:	Water beneath the surface of the earth.
HAZARDOUS MATERIAL:	Any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment.

IMPACT REPORT:	A public document prepared under the California Environmental Quality Act used by a governmental agency to analyze the significant environmental effects of a proposed project, to identify alternatives, and to disclose possible ways to reduce or avoid possible environmental damage.
IMPERVIOUS SURFACE:	A surface that does not allow water to penetrate such as pavement.
LESS THAN SIGNIFICANT:	An environmental condition change that does not exceed a stated CEQA standard of significance.
LEVEL OF SERVICE (LOS):	A measure of the mobility characteristics of an intersection, as determined by vehicle delay, which is estimated by a volume-to-capacity ratio.
MANO:	From the Spanish *la mano,* a loaf-shaped handstone used for grinding seeds, pigments, and so forth, on a metate or millingstone.
METATE:	A stone slab upon which corn and other grains are milled with a mano.
MITIGATION MEASURE:	Action taken to reduce or eliminate environmental impacts.
MOBILE SOURCE:	Motor vehicles, engines, and equipment that move, or can be moved, from place to place. Mobile sources include vehicles that operate on roads and highways, as well as non-road vehicles, engines, and equipment. Examples of mobile sources are cars, trucks, buses, earth-moving equipment, lawn and garden power tools, ships, railroad locomotives, and airplanes.
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES):	A system under the federal Clean Water Act that requires a permit for the discharge of pollutants to surface waters of the United States. In California, NPDES permits are obtained from the Regional Water Quality Control Board.
NATURAL GAS	Processed natural gas is primarily methane that remains from thermogenic gas after most of the heavier gas components are removed (usually less than 0.1 percent heavy thermogenic hydrocarbons).

NOISE:	Annoying, harmful or unwanted sound.
NON-ATTAINMENT AREA:	A geographic area in which a criteria air pollutant level is higher than allowed by the federal standards. A single geographic area may have an acceptable level for one criteria air pollutant, but have unacceptable levels of one or more other criteria air pollutants. Thus, an area can be both an attainment and non-attainment area at the same time.
NON-POINT SOURCE:	Source of pollutants, generally carried off the land by storms and runoff, that is spread out and has no single point of origin.
PARTICULATE:	Fine liquid or solid particles such as dust, smoke, mist, fumes, or smog, found in air or emissions.
PEAK HOUR:	In reference to public services infrastructure or transportation systems, the hour in which the greatest use occurs.
POINT SOURCE:	A stationary location or fixed facility from which pollutants are discharged or emitted.
RECYCLING:	A variety of processes by which reusable materials in the solid or hazardous waste streams are separated for reuse.
SEICHE:	An oscillation of the surface of a landlocked body of water that varies in period from a few minutes to several hours.
SPECIAL ANIMAL:	A general term that refers to the California Department of Fish and Game's California Natural Diversity Data Base tracks, regardless of their legal or protection status.
SPECIAL STATUS SPECIES:	Listed plant and animal species that receive specific protection defined in federal or state legislation and are formally designated as endangered, threatened or rare under state or federal legislation.
STATIONARY SOURCE:	Any building, structure, facility, or installation which emits or may emit any air pollutant. A stationary source includes all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) except the activities of any vessel.

STORMWATER:	That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, channels or pipes into a defined surface water channel or a constructed infiltration facility.
THERMOGENIC GAS	Thermogenic gas is gas generated at depth when increased temperatures and pressures alter organic material. It includes a broad range of gas components including methane, propane, butane, and ethane.
TRACE FOSSILS	Molds, casts, tracks, trails and burrow impressions made in soft clays and muds which subsequently were turned to stone, preserving the images of past life (e.g., shells, footprints, leaf prints, and worm tubes)
TRUE FOSSILS:	Lithified or replaced remains of plants and animals preserved in a rock matrix (e.g., microfossils, shells, animal bones and skeletons, and whole tree trunks).
TSUNAMI:	Great sea wave produced by submarine earth movement or volcanic eruption.
URBAN RUNOFF:	Stormwater from city streets and adjacent domestic or commercial properties that may carry pollutants of various kinds into sewer systems and/or receiving waters.
WETLAND:	An area that is saturated by surface or ground water with vegetation adapted for life under those soil conditions, as swamps, bogs, fens, marshes, and estuaries.

8.2 ACRONYMS USED IN THIS EIR

AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
AHM	Acutely Hazardous Material
amsl	Above mean sea level
AQMP	Air Quality Management Plan
AST	Aboveground Storage Tank
bgs	Below Ground Surface

BMP	Best Management Practice
BP	Before Present
BTEX	Benzene, Ethyl Benzene, and Xylenes
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal/OSHA	California Occupational Health and Safety Administration
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDM	Camp Dresser and McKee
CDMG	California Division of Mines and Geology
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CIWMB	California Integrated Waste Management Board
CMP	Congestion Management Plan
CNDDB	California Natural Diversity Data Base
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
CPUC	California Public Utilities Commission

CUWCC	California Urban Water Conservation Council
CWA	Clean Water Act
CWC	California Water Code
dB	Decibel
dBA	Decibel Adjusted
dbh	Diameter at Breast Height
DEIR	Draft Environmental Impact Report
DNL	Day-Night Average Sound Level
DOGGR	Division of Oil, Gas and Geothermal Resources
DOT	Department of Transportation
DPM	Diesel Particulate Matter
DWR	California Department of Resources
ECI	Earth Consultants International
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ESA	Environmental Science Associates
ETI	Exploration Technologies International, Inc.
FCAAA	Federal Clean Air Act Amendment
FESA	Federal Endangered Species Act
FID	Flame ionization detector
g.	Gravity
H_2S	Hydrogen Sulfide
HAP	Hazardous Air Pollutant
HHRA	Human Health Risk Assessment

I-10	Santa Monica Freeway
I-105	Anderson Freeway
I-405	San Diego Freeway
ICBO	International Conference of Building Officials
ITE	Institute of Traffic Engineers
LADPW	Los Angeles Department of Public Works
LADWP	Los Angeles Department of Water and Power
LAX	Los Angeles International Airport
LEL	Lower Explosive Limit
LFL	Lower Flammable Limit
LOS	Level of Service
MDR	Marina del Rey
MGD	Million Gallons per Day
µg/L	Micrograms per liter
$\mu g/m^3$	Micrograms per cubic meter
MM	Modified Mercalli
MOU	Memorandum of Understanding
Mph	Miles per hour
MPO	Metropolitan Planning Organization
MS4s	Municipal Separate Storm Sewer
Mw	Moment magnitude
MWDSC	Metropolitan Water District of Southern California
NAAQS	National Ambient Air Quality Standards
NO_2	Nitrogen Dioxide

NO_x	Nitrogen Oxide
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
O_3	Ozone
OEHHA	Office of Environmental Health and Hazard Assessment
OSHA	Occupational Health and Safety Administration
Pb	Lead
PDR	Playa del Rey
PEL	Permissible Exposure Limit
PGA	Peak Ground Acceleration
PHGA	Peak Horizontal Ground Acceleration
PM	Particulate Matter
ppb	Parts per billion
ppbv	Part per billion by volume
ppm	Parts per million
ppmv	Parts per million by volume
PSM	Process Safety Management
RCRA	Resource Conservation and Recovery Act
RMP	Risk Management Plan
ROC	Reactive Organic Compound
RWQCB	Regional Water Quality Control Board
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District

SCG	Southern California Gas Company
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SR	State Route
SR 90	Marina Freeway
SUSWMP	Standard Urban Storm Water Mitigation Plan
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
THC	Total Hydrocarbon Compounds
TIA	Transportation Impact Assessment
TPH	Total Petroleum Hydrocarbons
TSCA	Toxic Substances Control Act
UBC	Uniform Building Code
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
v/c	volume/capacity

APPENDIX A

NOTICE OF PREPARATION AND INITIAL STUDY CHECKLIST AND COMMENT LETTERS RECEIVED

SOUTHERN CALIFORNIA GAS COMPANY'S APPLICATION TO VALUE AND SELL SURPLUS PROPERTY AT PLAYA DEL REY AND MARINA DEL REY

Initial Study

CPUC Application No. 99-05-029

September 2003

Prepared for
California Public Utilities Commission

ESA Environmental Science Associates

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EXECUTIVE SUMMARY

S.1 INTRODUCTION

Southern California Gas Company (SCG), in its California Public Utilities Commission (CPUC) application (A.99-05-029), proposes a sale of surplus SCG property in Playa del Rey (PDR) and Marina del Rey (MDR). This Initial Study considers environmental impacts from the potential development of the 36 lots that comprise these properties. All lots are designated for residential use except for one, which is designated for limited commercial use. If SCG's application is approved by the CPUC, SCG proposes to commence with the sale of the lots in 2004. Under Public Utilities Code Section 851, approval of the proposed sale must comply with the California Environmental Quality Act (CEQA) in order to assess the potential environmental impacts of the proposed project. Based on the assessment presented in this Initial Study, it is recommended that the CPUC prepare an Environmental Impact Report (EIR) for the proposed project.

As required by CPUC guidelines, the California Environmental Quality Act (CEQA) Initial Study Checklist was used as the format for describing potential impacts. The level of research and analysis provided is intended to satisfy the requirements to determine the need for an EIR pursuant to CEQA.

This document is organized as follows:

- This Executive Summary is provided to introduce the project and present the project description in brief as well as describe the approach to the analysis contained in the body of the document.
- The Impacts section documents all required CEQA checklist items and a discussion of those impacts and their significance.
- Appendices follow the Impacts. Appendix A contains detailed history and background information for each lot. Appendices B through I provide background information for air quality; biological resources; cultural and historical resources; geology and soils; hydrology and water quality; hazards and hazardous materials; land use; and noise.

S.2 PROJECT DESCRIPTION

The project area is located approximately 4 miles south of the city of Santa Monica, 1.5 miles north of the Los Angeles International Airport, 0.5 miles west of Culver City, and is bordered by the Santa Monica Bay to the west. PDR is located within the City of Los Angeles and MDR is located within the County of Los Angeles. MDR is approximately 2 miles northwest of PDR, separated by the Ballona Wetlands and the MDR Channel.

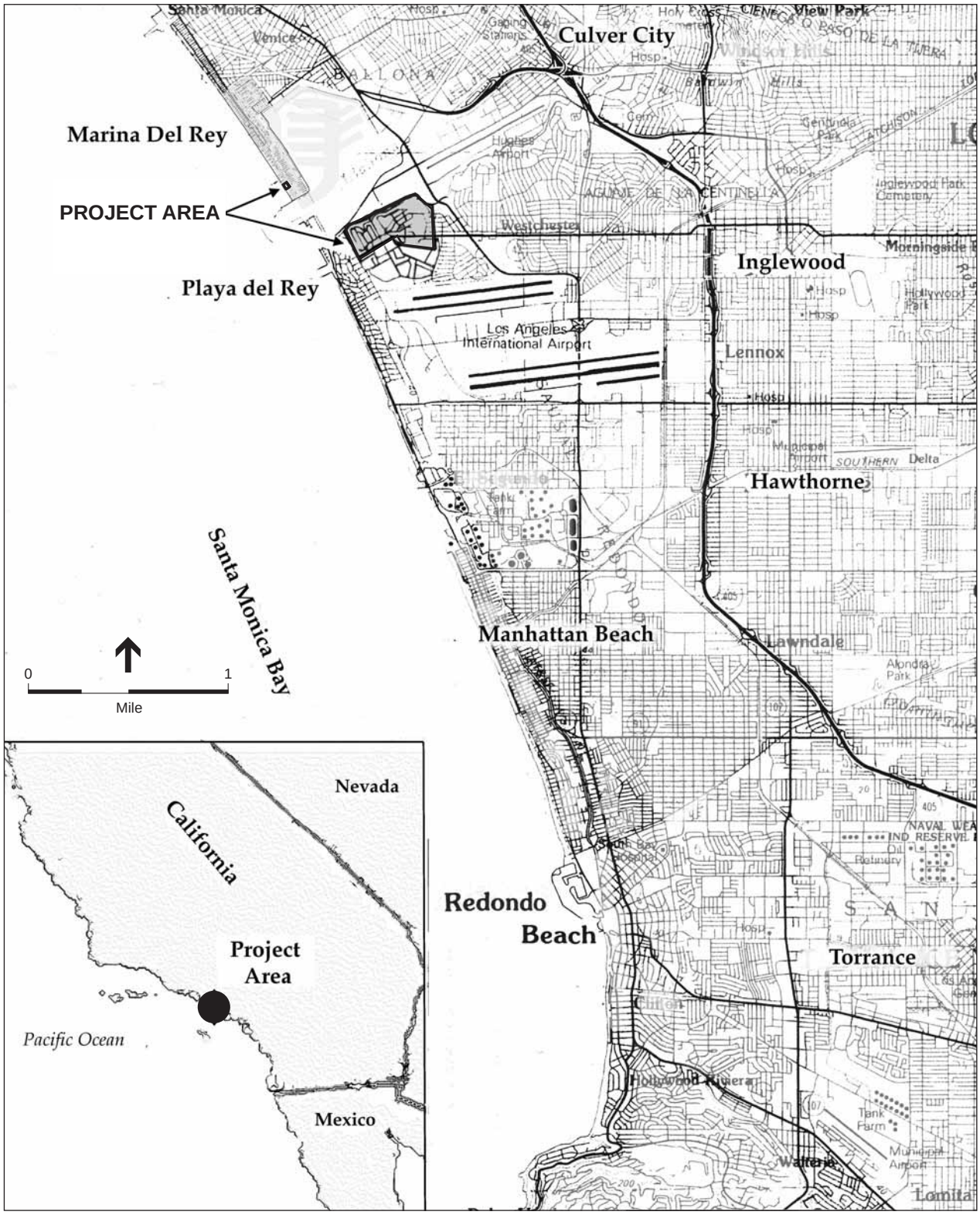
The 34 undeveloped lots proposed for sale located in PDR are grouped into lot clusters of one to eight lots (See Table 1). The two MDR lots represent a single cluster and are located approximately two miles north of PDR. There are 12 abandoned SCG wells located on the proposed project lot clusters (see Table 1). Each cluster (with typically two to four lots per cluster) contains one well. Cluster 1 contains only a single well located on a single lot. Cluster 8 has two wells, each associated with either the 4 north lots or the 4 south lots. Originally, SCG maintained ownership of these lots associated with those wells utilized as oil production wells and those converted for gas storage operations. In order to operate and maintain such wells, sufficient land around each well was required to support the transport and operation of heavy equipment used in well servicing. These 12 abandoned wells were once used as observation or monitoring wells for SCG's Playa del Rey Gas Storage Facility (PDRGSF).

TABLE 1
PROJECT LOTS AND RELATED ABANDONED WELLS

Cluster No. / Location	No. of Lots	Well Designation	Date Abandoned
Playa del Rey			
1) Corner of 81st/Berger Place	1	Anglo American	July 1958
2) North side of 82nd Avenue	2	Joyce 1	March 15, 1993
3) Corner of 83rd and Saran Drive	3	Lormar 1	December 1, 1992
4) 85th Street	2	O and M 1	April 1956
5) Saran Drive	1	Hisey 1	November 9, 1992
6) Manchester Avenue	3	Merrill 1	September 24, 1992
7) 83rd Avenue Middle of 81st−82nd	5	13-1	October 2, 1992
8) 79th and 83rd	8	23-1	July 14, 1993
9) 83rd Avenue (Western 83rd)	4	Samarkand 1	December 8, 1992
10) Falmouth / Calabara Avenue	3	29-2	July 26, 1994
11) Falmouth / Calabara Avenue	2	29-1	August 4, 1994
Marina del Rey			
12) Union Jack / Speedway	2	Troxel 1	March 15, 1994

SOURCE: Brown and Caldwell (2002)

A general project location is shown on Figure 1 and an aerial photograph of the property and surrounding area is presented in Figure 2. See Figures 3 and 4 for the mapped locations of the PDR and MDR lots. See Appendix A for an expanded description of the lots and abandoned wells.



SOURCE: Environmental Science Associates

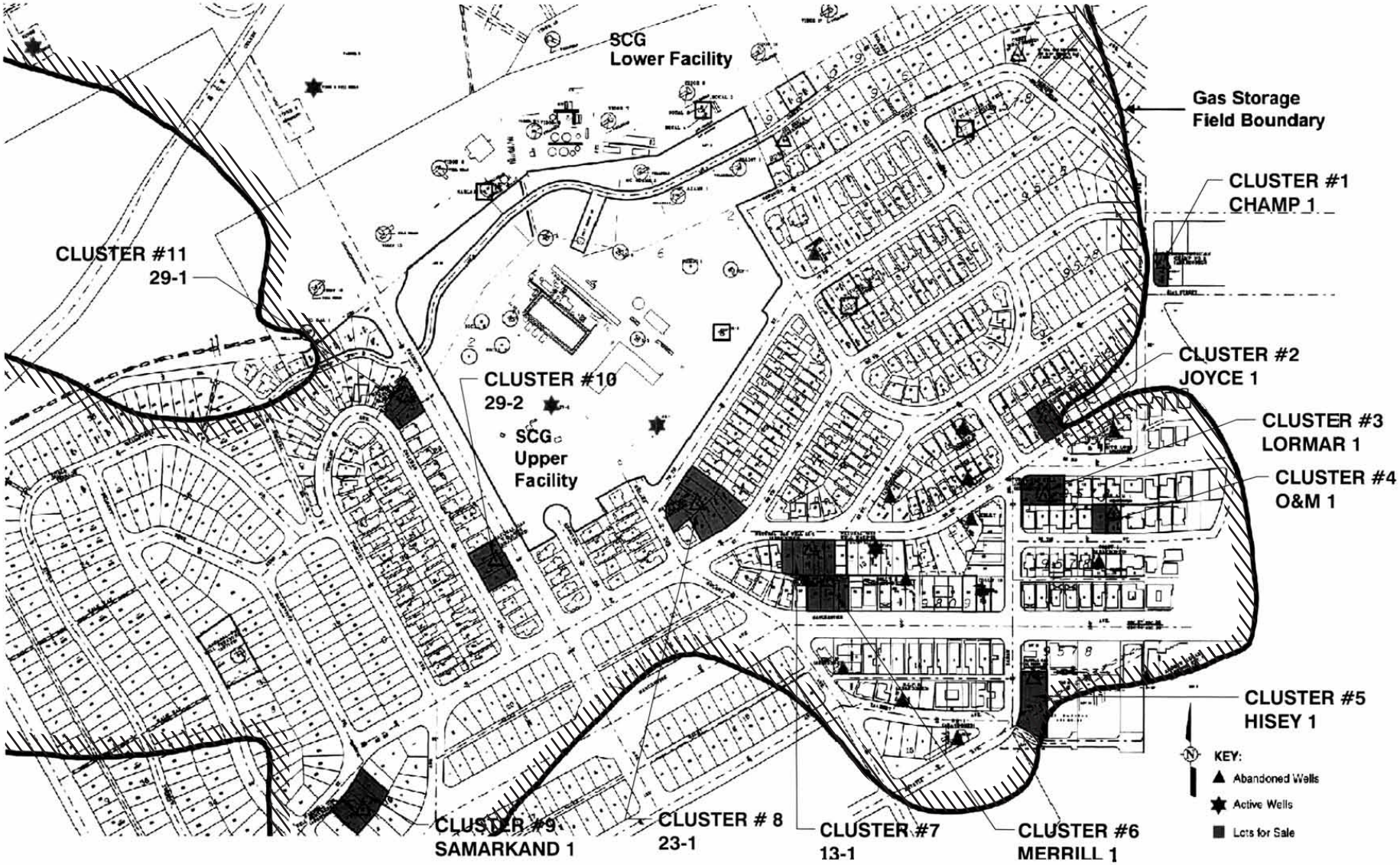
SCG Valuation and Sale of Surplus Property at Playa del Rey and Marine del Rey Project / 202639 ■

Figure 1

Project Vicinity Map

SOURCE: Environmental Science Associates

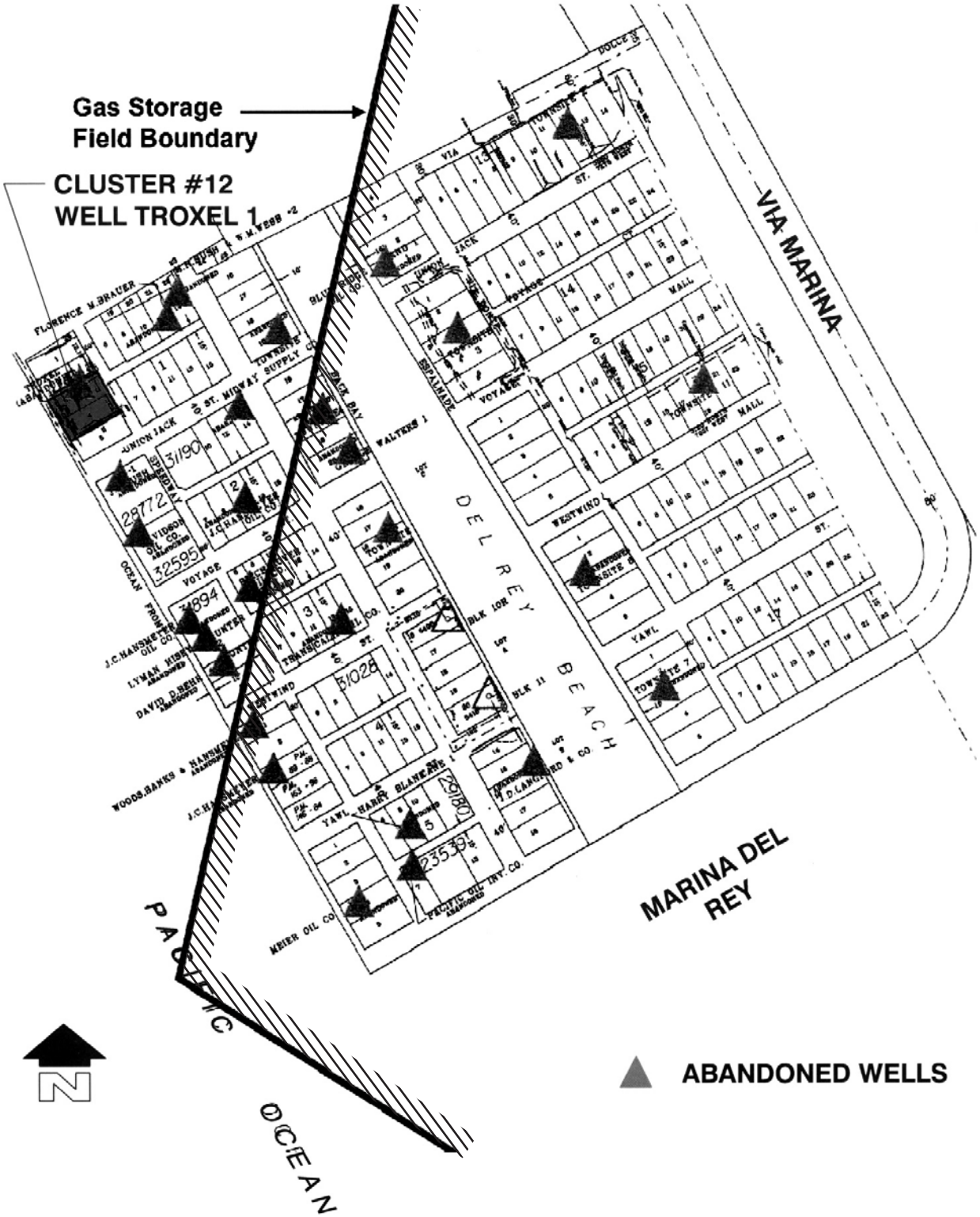
Figure 2
Aerial Map of Project Area



SOURCE: Environmental Science Associates

Figure 3

Annotated Site Map - Playa Del Rey



SOURCE: Environmental Science Associates

Figure 4

Annotated Site Map - Marina Del Rey

Under the proposed project, SCG would sell the undeveloped lots to 4 different buyers. One buyer would purchase a single lot, while the other three would acquire the remaining 11 clusters of 35 lots.

S.3 HISTORICAL BACKGROUND

All lot clusters overlie the existing SCG PDRGSF as shown on Figures 3 and 4. This gas storage field lies approximately 6000 feet below ground surface and has had an extensive history of activity in the 20th century. Oil drilling in the PDR / MDR region began as early as 1921. Early holes drilled and abandoned in the area during 1925 and 1926 were not deep enough to reach the oil producing zones. The discovery well for PDR Oil Field was completed in 1929. Primary field development continued through the mid-1930s. By the early 1940s, production had reached its economic limit and operators abandoned oil production from the field.

In 1942, as part of the national war effort, the Federal government condemned and took possession of approximately 240 acres of the PDR field area to use as a natural gas storage field. This gas storage field was later transferred to the Reconstruction Finance Corporation in 1945. Then, in 1953, the Reconstruction Finance Corporation declared the field surplus and offered for sale in 1953. SCG was the successful bidder and assumed operations in late 1953. Facilities were completed in 1956, and then gas was injected and stored at depths of about 6,200 feet within the Conglomerate Trap Zone. By July 1958, approximately 27 billion cubic feet (bcf) of cushion gas was stored. Since that time, numerous wells have been utilized for storage and retrieval of the gas. Currently, the storage field is operated through 54 wells directionally drilled from the lowlands and hilltop of PDR. Of these 54 wells, 25 are injection/withdrawal wells used to inject and extract gas, 8 are liquid (primarily water) removal wells, 3 are lateral migration wells to control gas movement, and 18 are observation wells used to monitor pressure and liquid saturation. SCG's Facility for the PDRGSF is 0.2 mile north of Manchester Avenue.

Originally, the wells and associated lots described in this document were used or could have been used for monitoring of gases and liquids in the storage zones (6000 ft below ground surface). Similarly, these wells and lots may be developed for later use if needed for the gas storage system. As shown on Table 1, all 12 wells considered in this document have been abandoned some years ago. Today, the lots provide no useful or commercially viable contribution to the operations and maintenance of the SCG PDRGSF. SCG believes that their remaining wells and facilities are adequate to allow for continued operations of the PDRGSF following the proposed sale of the 36 lots.

S.4 APPROACH TO ANALYSIS

The scope of the environmental analysis described in this document assumes that sale of the 36 lots is approved. Furthermore, the proposed sale of the lots is considered to have a reasonably foreseeable future connected action, which includes the eventual conversion to developed urban land uses consistent with existing zoning, and adjacent land uses. For the purposes of this document, this future connected action is considered to be the construction and occupancy of

residential property on most of the lots.[1] Note that the proposed and connected action is not related to the continued operations of SCG's gas storage facilities or related systems. It is also considered that the property transfer (sale) requires compliance with all applicable environmental laws, permits, and approvals and such requirements be made a condition of any sale.

PROJECT OWNERSHIP TRANSFER AND CONDITIONS

Sale of the SCG lots would generally result in the "clean and clear" of the site(s) for all locations, or cleanup of each site to a level suitable for the new qualified owner(s). The following discussion clarifies the transfer methods and conditions for the future owner(s).

CONDITIONS OF OWNERSHIP TRANSFER

Per SCG's sale agreement, the lots are to be sold "as-is" and do not carry any action for future development. Sub-surface and mineral rights would be retained by SCG and would not be included in the sale. SCG would be obligated, in perpetuity, to mitigate for any potentially adverse effects the wells may have on future beneficial uses of the surface rights associated with these lots. Mitigation measures proposed in the EIR and other CPUC conditions would be required as part of any sales agreement because any mitigation measure required to be complied with by subsequent property owner(s) are not subject to CPUC review and authority, since after the transfer of property the CPUC has no further oversight authority with the lots.

LIABILITY

A thorough environmental investigation would be performed prior to transfer of the property. New qualified owner(s) would be provided with the documentation from an independent environmental consultant detailing the conditions found, and any remaining cleanup not completed. New qualified owner(s) would also be provided with adequate time to complete their own investigation if they desire to do so. New qualified owners would have the right to terminate the purchase agreement if conditions found are different from those represented by SCG. The sales agreement specifies that the properties would be sold "as is," with the new qualified owner(s) assuming all liability for cleaning up any remaining contamination from past use of the property. The new qualified owner would indemnify SCG and its ratepayers from any future liability for contamination found on the property after the sale.

SCG would pre-qualify prospective owners to ensure that they have adequate resources to ensure that liability does not revert back to SCG and the ratepayers due to financial failure of the purchaser. SCG would evaluate the new qualified owners(s) to determine if there is a corporate structure that could cause liability to revert back to SCG and the ratepayers. If SCG has other concerns about the new qualified owner's future ability to carry out any remaining cleanup of the properties, SCG may require the new qualified owner(s) to provide financial assurance (such as environmental insurance) with SCG as the beneficiary in the event that the new qualified

[1] One of the lots (Cluster 5) is zoned for commercial uses and that property would be expected to be developed for such uses.

owner(s) fails to comply with laws and regulations or otherwise defaults on its obligations under the sales agreement.

ENVIRONMENTAL COMPLIANCE

Compliance with all applicable environmental laws, permits, and approvals would be made a condition of any sale to a new property owner. SCG would disclose to the prospective purchaser(s) any areas which SCG suspects could be contaminated with hydrocarbons or other substances and/or areas with past contamination that have been remediated.

S.5 ENVIRONMENTAL CHECKLIST FORM

1. Project Title:	Southern California Gas Sale of Surplus Property at Playa del Rey (PDR) and Marina del Rey (MDR)
2. Lead Agency Name and Address:	California Public Utilities Commission 505 Van Ness Avenue San Francisco, California 94102
3. Contact Person and Phone Number:	Roosevelt Grant Project Manager (415) 355-5492 (415) 703-2200 (fax)
4. Project Location:	Playa del Rey and Marina del Rey, (Los Angeles), California
5. Project Sponsor's Name and Address:	Southern California Gas Company 8141 Gulana Avenue Playa del Rey, California 90293 (310) 578-2689
6. General Plan Designation:	All but one of the 36 lots is designated for residential use and one is designated for limited commercial use.
7. Zoning:	Thirty lots are R1-1 (Single-family residential), five lots are R3-1 (Multi-family residential), and one lot is CR-1 (Commercial)
8. Description of Project:	See PROJECT DESCRIPTION (Section S.2).

9. Surrounding Land Uses and Setting:

The project area is located approximately 4 miles south of the City of Santa Monica, 1.5 miles north of the Los Angeles International Airport, 0.5 miles west of Culver City, and, is bordered by the Santa Monica Bay to the west. PDR is located within the City of Los Angeles and MDR is located within the County of Los Angeles. MDR is approximately 2 miles northwest of Playa del Rey, separated by the Ballona Wetlands and the MDR Channel.

The project involves two areas on the north and south sides of Ballona Lagoon in existing developed urban areas. The lots have no access to Ballona Lagoon, the Ballona wetlands, or other sensitive areas, with the exception of the ocean frontage associated with the two lots in MDR.

10. Other public agencies whose approval is required:

Division of Oil, Gas, and Geothermal Resources (DOGGR)
South Coast Air Quality Management District (SCAQMD)
City of Los Angeles
Los Angeles Fire Department
County of Los Angeles
County of Los Angeles Sanitation Department
California Occupational Health and Safety Administration (CalOSHA)
Regional Water Quality Control Board (RWQCB)

S.6 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture Resources	☒ Air Quality
☒ Biological Resources	☐ Cultural Resources	☐ Energy
☒ Geology / Soils	☒ Hazards & Hazardous Materials	☒ Hydrology / Water Quality
☐ Land Use / Planning	☐ Mineral Resources	☒ Noise
☐ Population / Housing	☐ Public Services	☐ Recreation
☐ Transportation / Traffic	☐ Utilities / Service Systems	
	☒ Mandatory Findings of Significance	

DETERMINATION: (To be completed by Lead Agency)
On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature _____ Date _____

Rob Feraru, Assistant Director of Energy Division

IMPACTS DISCUSSION

EVALUATION OF ENVIRONMENTAL IMPACTS

The determination of whether a project may have a significant effect on the environment is a critical step in the CEQA process. Consistent with *CEQA Statutes Section 21083* (SignificanceGuidelines) and *CEQA Guidelines Section 15065* (Mandatory Findings of Significance), significance levels as provided in the checklist are generally defined as follows:

- *Potentially Significant Impact* applies where there is substantial evidence that an effect may be significant. The CEQA Guidelines define "significant effect" as "…a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant" (CEQA Guidelines, 15382).

- *Less than Significant with Mitigation Incorporated* applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The EIR must describe the mitigation measures, and briefly explain how they reduce the effect to a less-than-significant level.

- *Less Than Significant Impact* applies where the project creates no significant impacts, only less than significant impacts.

- *No Impact* applies where a project does not create an impact in that category. "No Impact" answers need to be adequately supported by information which shows that the impact simply does not apply to project.

I. AESTHETICS

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
I.	**AESTHETICS—Would the project:**				
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d)	Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

SUMMARY

All likely aesthetic impacts of the project are considered to be less than significant, as the potential development of these lots would be assimilated with the existing surroundings of the neighborhoods. Therefore, impacts to aesthetics will not be considered further in the EIR.

A brief description of the clusters and associated lots is provided below. Figures I-1 through I-12 provides photo documentation of each of the clusters and associated lots (see Appendix A for a brief description of the lots).

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

a) Would the project have a substantial adverse effect on a scenic vista?

Future development of the 34 PDR lots would minimally affect the current vistas of the residential areas adjacent to the lots for sale. All but four of the lots are located on level topography or have minimal slopes; therefore, construction activities and resulting residential structures would primarily affect the vistas of neighboring residential structures. Development would change the current character of the lots but would not change the character of the surrounding residential neighborhood, as new developments would be consistent with surrounding residential zoning. Therefore, impacts on scenic vistas would be less than significant.

Figure I.1 - Cluster 1 - Lot 6 on the Corner of 81st Street and Berger Place

Figure I.2 - Cluster 2 - Lots 3, 4 on 82nd Street

Figure I.3 - Cluster 3 - Lots 14-16 on 83rd Street

Figure I.4 - Cluster 4 - Lots 6, 7 on 85th Street

SOURCE: Environmental Science Associates

Figure I.5 - Cluster 5 - Lot 11 on Saran Drive

Figure I.6 - Cluster 6 - Lots 14-18 on 83rd Street

Figure I.7 - Cluster 7 - Lots 28-30 on Manchester Avenue

Figure I.8 - Cluster 8 - Lots 17-20 on 79th Street and Lots 82-85 on 83rd Street

SOURCE: Environmental Science Associates

Figure I.9 - Cluster 9 - Lots 5, 6, 7, 8 on 83rd Street

Figure I.10 - Cluster 10 - Lots 5, 6, 7 on Calabara Avenue

Figure I.11 - Cluster 11 - Lots 18, 19 on Calabara Avenue

Figure I.12 - Cluster 12 - Lots on Speedway in Marina del Rey

SOURCE: Environmental Science Associates

Future development of the two lots in MDR would change the current vista along the strip of Venice Beach where the lots are located. Development of these lots may partially block the views of surrounding residential structures, including those adjacent to the lots on Union Jack street and those directly behind the lots on Speedway Avenue. In particular, buildings located directly behind the MDR lots on Speedway Avenue would likely have their views of Venice Beach and the Pacific Ocean blocked by new development on the lot. Views from Ocean Walk would be changed with the additional development. However, because the MDR lots are zoned for residential use the new development would be in character with the surrounding residential area. Therefore, impacts on scenic vistas would be less than significant.

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

All of the PDR lots contain vegetation, including trees and grass. It is likely that many of the trees would be removed during construction activities. It can be assumed that some of the trees would be removed during construction and the resulting landscaping around the new homes would be similar to other yards in the neighborhood. Although there would be an impact on the scenic resources in the area, such a change in landscaping would be consistent with surrounding land uses. Therefore, impacts to scenic resources would be less than significant.

The MDR lots are covered by sand and sparse vegetation. There are no trees or rock outcroppings on the MDR lots. Therefore, future development of these lots would not result in removal of a significant number of trees, rock outcroppings, etc. There would be no impact to scenic resources at the MDR lots.

c) Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

Future development would change the appearance of the 34 PDR lots from scattered open spaces to residential structures. Development of the lots would consist primarily of in-fill development of residential uses in an established residential neighborhood. Development of the PDR lots would be consistent with their current zoning (30 lots are zoned for single-family residential use, three lots are zoned for multi-family use, and one lot is zoned for residential/commercial use). Vegetation and trees would likely be removed from most of the lots and replaced with single- or multi-family homes and landscaped yards. One parcel could be developed with a commercial use under the current zoning. New fencing would also change the existing character of the lots. Although development would visually change the appearance of the lots from that of scattered open spaces and mature vegetation to residential (or commercial) uses, this is not considered to be a degradation of the visual quality of the sites or their surroundings as the development would be consistent with the surrounding area and zoning ordinances. Therefore, the impact on the visual quality of the site would be less than significant.

Development of the two MDR lots would change the visual character of this strip of land along Venice Beach. These adjacent lots provide a visual break with the neighboring residential developments. Although development of the lots would mean a loss of open space amongst dense apartment structures, it would be consistent with surrounding land use. Therefore, the impact on the visual character of the site would be less than significant.

d) Would the project create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?

Future development of the PDR and MDR lots would create additional street and structural related lighting in the area. Although the addition of new structures would increase local glare, development lighting and glare would be similar to existing light sources and be consistent with the light and glare continuity of the neighborhood. The new structures would not result in a substantial increase in light or glare and would not adversely affect day or nighttime views in the area. Therefore, the impact on light or glare would be less than significant.

II. AGRICULTURAL RESOURCES

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
II.	**AGRICULTURE RESOURCES** In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. **Would the project:**				
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒

SUMMARY

The proposed project would have no impact on agricultural resources because there are no agricultural resources present at the site vicinity. Therefore, agricultural resources will not be considered further in the EIR.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

a) Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

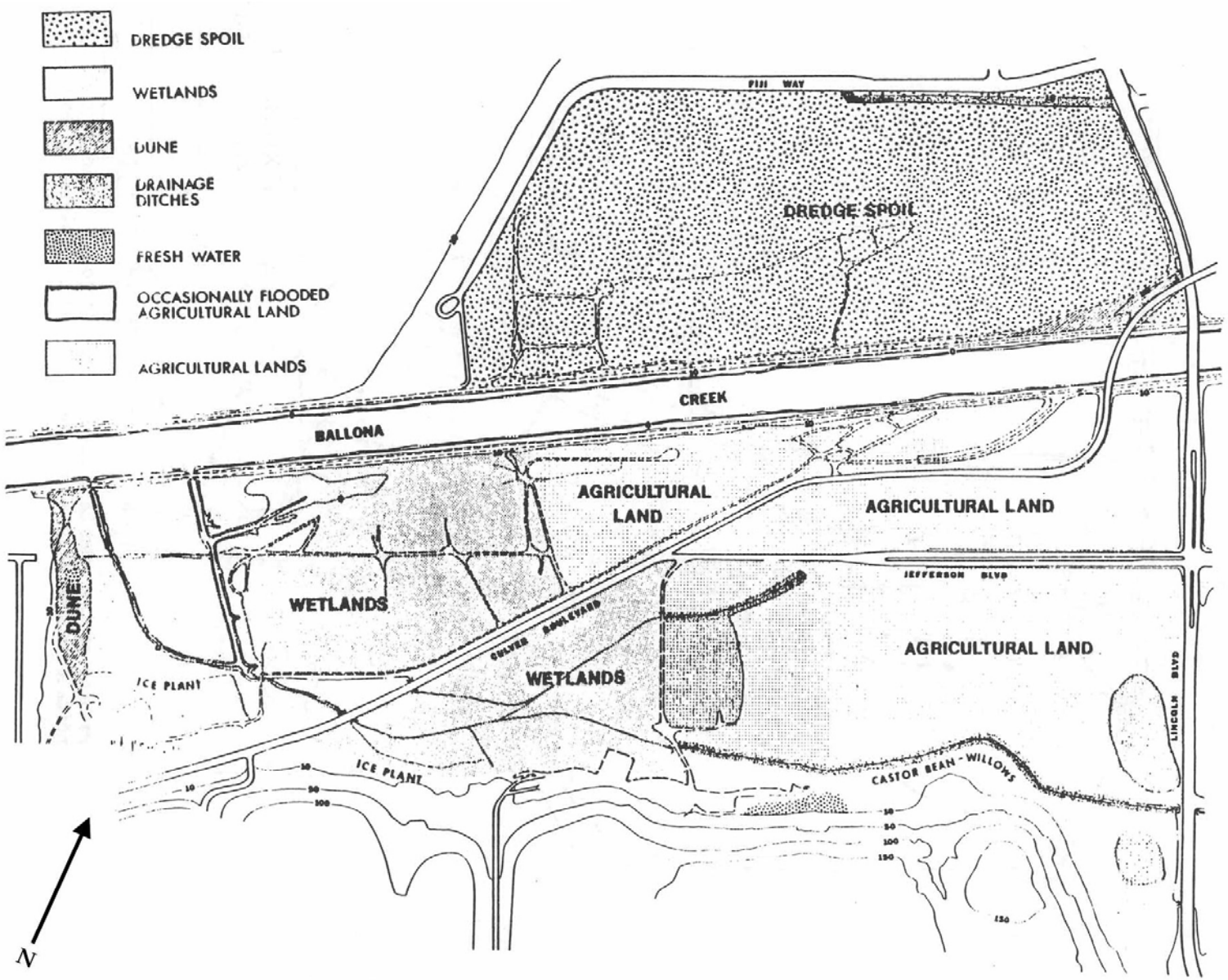
While the County of Los Angeles contains abundant agricultural resources, the communities of PDR and MDR do not possess active agricultural lands. PDR is a coastal community, within the jurisdiction of the City of Los Angeles, predominately comprised by single-family homes. The area surrounding the PDR lots is dominated by residential and recreational uses. The residential portion of the community lies within the jurisdiction of the City of Los Angeles, whereas the marina is an unincorporated area within the County of Los Angeles.

Historical records of agricultural use for the PDR lots indicate the site was farmed through the 1930s; prior to the time that the property was purchased in the early 1940s (see Figure II-1). Since the 1940s, the acreage committed to agriculture in the portion of the property outside the coastal decreased gradually as development expanded. In 1970 a private resident began farming the property; no new acreage has been opened to farming use since that time (California Coastal Commission, 1983).

The 34 scattered lots throughout the PDR neighborhood and the two lots in the MDR have no classified soil suitable for nursery or other agricultural uses. The project would not impact Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.

b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

The PDR and MDR lots are not zoned for agricultural use and a Williamson Act contract is not in place for the project area. Sale of the lots and subsequent development of the lands for urban uses would therefore not result in uses inconsistent with agricultural zoning nor in conflict with lands under Williamson Act contract.



SOURCE: Environmental Science Associates, USGS, Pacific Meridian Resources

Figure II-1

Playa del Rey/Ballona Region Circa 1930s

c) Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland, to non-agricultural use?

The PDR and MDR lots are not located on or near lands that are considered farmland by state, regional or local agencies. Sale of the lots and subsequent development of the lands for urban uses would not result in uses inconsistent or detrimental to existing or future agricultural activities in the area nor would the sale or subsequent development promote or accelerate the conversion of such existing agricultural lands to non-agricultural uses.

III. AIR QUALITY

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
III.	**AIR QUALITY** Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. **Would the project:**				
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b)	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
e)	Create objectionable odors affecting a substantial number of people?	☐	☒	☐	☐

SUMMARY

The proposed project presents potentially significant air quality related impacts from potential exposure of sensitive receptors to methane and odor impacts from potentially leaking wells of the PDRGSF. These impacts will be analyzed and considered in greater detail in the EIR with the addition of new field sampling data currently being collected.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

Please see Appendix B for an extensive background analysis of the Air Quality resource.

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

Air emissions in the South Coast Air Basin (SCAB) are regulated by the South Coast Air Quality Management District (SCAQMD). Pursuant to the federal Clean Air Act (CAA), the SCAQMD is required to reduce emissions of criteria pollutants for which the SCAB is in non-attainment. Strategies to achieve these emissions reductions are developed in the Air Quality Management Plan (AQMP) prepared by SCAQMD (1997) for the region. Chapter 3 of the 1997 AQMP states, "future emissions forecasts are based on demographic and economic growth projections provided by the Southern California Association of Governments (SCAG)." Individual projects and long-term programs within the region are required to be consistent with population, employment, and housing projections.

Currently, the City of Los Angeles is updating the Westchester Community Plan and General Plan Framework. The update to the Westchester Playa Del Rey Community Plan and General Plan Framework Element plans for a population increase of 42,586 people over the next twenty years. The population increase would lead to a planned increase of 24,443 housing units in the Plan area.

Development of the PDR and MDR lots would provide as many as 80 housing units. Development associated with the property sale is accounted for in the Community and General Plan Framework. Development of the property would construct less than one percent of the planned homes for this community plan area. According to demographic projections, development arising from the sale of the subject properties would be consistent with SCAG housing projections and as such would be consistent with the AQMP.

The SCAQMD (2000) Air Toxics Control Plan is intended to protect the public from possible sources of air toxics emissions. Future development on project lots, if performed on top of the abandoned oil and gas wells, could impede access to controlling any potential future leaks from these wells and potentially result in a release of air toxics. However, given the history of oil and gas development in the project area it is not uncommon at all for structures to be installed on abandoned oil and gas well sites. With proper well abandonment procedures and compliance with any required protection measures for construction atop such facilities, no planning inconsistencies should occur. Development associated with the proposed project would not conflict with or obstruct implementation of applicable air quality plans and therefore would represent a less than significant impact.

b) Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

The primary project impact would derive from sources of air emissions associated with homes or commercial buildings built upon the 36 lots. Emissions sources would include stationary and mobile sources. Stationary sources of emissions include onsite emissions generated as a result of the combustion of natural gas and off-site emissions resulting from an increased electrical energy demand. Stationary source emissions would contribute an insignificant amount to local operational emissions when compared to mobile sources of emissions. Mobile source emissions are motor vehicle emissions and would be the largest source of pollutants that would result from the implementation of the proposed project.

The SCAQMD has established emissions significance thresholds for construction and operational emissions. For planning purposes, the SCAQMD has published screening tables for operations to assess potential significance for air quality.[2] The SCAQMD has established a threshold for potentially significant air quality impacts at 166 housing units. The proposed project could lead to the addition of up to 80 housing units. According to the SCAQMD CEQA Air Quality Handbook, operational emissions associated with the addition of 80 housing units would not be anticipated to result in a significant impact to air quality.

The SCAQMD has established air emissions thresholds associated with construction projects. Construction related emissions would primarily be, 1) dust generated from grading and excavation; 2) hydrocarbon emissions from paints and asphalt; 3) exhaust emissions from powered construction equipment; and 4) motor vehicle emissions associated with construction activities. Construction on the individual parcels could occur over a wide or narrow time frame depending on the individual developer's time schedules. A worst-case scenario would involve the simultaneous development of all project parcels.

For planning purposes, the SCAQMD has published screening tables for construction projects to assess potential significance for air quality.[3] The SCAQMD has established a threshold for potentially significant air quality impacts at 1,309,000 square feet of construction per three-month period. Assuming that each house would be 3,000 square feet, the proposed project could lead to the total construction of 240,000 square feet of residential properties. As the proposed project would not exceed screening table thresholds, construction associated with development of the lots would not be anticipated to result in a significant impact to air quality. Development of the PDR and MDR lots would not violate any air quality standard or contribute substantially to an existing or projected air quality violation and would be a less than significant impact.

Although the proposed project, based on this screening analysis represents a less than significant impact, SCAQMD CEQA rules require that this impact be considered further in greater detail and quantification of potential construction and operation emissions as well as any mitigation measures in the EIR (SCAQMD, 1993).

2 SCAQMD CEQA Air Quality Handbook, 1993, Table 6-2. Screening Tables for Operation-Daily Thresholds of Potential Significance for Air Quality.

3 SCAQMD CEQA Air Quality Handbook, 1993, Table 6-3. Screening Tables for Construction-Quarterly Thresholds of Potential Significance for Air Quality.

c) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?

The same threshold levels comprising a "substantial" contribution to an existing, or projected air quality violation in checklist item "b" above would also apply to a "cumulatively considerable net increase." The project is located in a non-attainment area for ozone, carbon monoxide and particulate matter. Any increase in precursor pollutants from cumulative growth would be potentially adverse. While the impact from this single project would be well below SCAQMD significance thresholds, cumulative impacts can potentially result from the addition of hundreds of small projects that exacerbate the basin's inability to meet clean air standards. The proposed project is not expected to exceed SCAQMD significance criteria for construction or operational activities. As such, the addition of as many as 80 housing units would not cumulatively impact air quality on a regional scale. Development of the PDR and MDR lots would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under applicable federal or state ambient air quality standards and is therefore a less than significant impact.

d) Would the project expose sensitive receptors to substantial pollutant concentrations?

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. SCAQMD (1993) includes in its list of sensitive receptors that includes:

- Residences
- Schools
- Playgrounds
- Childcare centers
- Convalescent homes
- Retirement homes
- Rehabilitation centers
- Athletic facilities

Sensitive population groups include:

- Children
- Elderly persons
- Acutely and chronically ill persons (especially those with cardio-respiratory diseases)

Residential areas are also considered to be sensitive to air pollution because residents tend to be home for extended periods of time, resulting in sustained exposure to any pollutant present. Given the existing land uses (predominately residential) in the PDR and MDR area, all properties adjacent to the project lots meet this criteria for sensitive receptors and are considered in this study as such.

All project lots are located in residential neighborhoods and are surrounded by residential properties. If the abandoned oil or gas wells on the lots were to leak, new residents living on the project lots could be exposed to elevated pollutant levels that could possibly and occasionally exceed Ambient Air Quality Standards. It is also possible that some new PDR lot owners could be exposed to emissions from ongoing operations or accidental releases of methane at the nearby PDRGSF. However, this potential impact is actually a baseline condition and not considered a direct impact of the proposed project.

There are three potential exposure scenarios that may expose sensitive receptors to substantial pollutant concentrations:

1) Existing receptors may be exposed to elevated levels of diesel particulate matter during construction activities.

2) Construction atop abandoned oil and natural gas wells could cause off-site migration of sub-surface gases that could expose sensitive receptors to toxic or explosive gasses associated with potentially leaking abandoned well-heads.

3) Normal operations at the PDRGSF or unplanned releases of toxic contaminants from the PDRGSF or any associated well-heads could expose new residents of the sale lots to potentially toxic air contaminants.

The following is a break down of each of these exposure scenarios.

Construction Activities

The use of heavy-duty diesel engines at the project sites could expose nearby residents to diesel particulate matter. Diesel particulate matter is a chemical known to the State of California to cause cancer in certain concentrations. Due to the relatively short-term exposure, nearby residents likely would not be exposed to substantial pollutant concentration. As such, construction at the project sites is not expected to expose existing sensitive receptors (nearby residents) to substantial toxic air contaminants.

During construction of future buildings on the projects lots, digging activities could cause a release of gas from the abandoned wells through the accidental damaging of the buried well heads. With proper marking of the abandoned wells and consideration of placement of future structures on the lots, it is unlikely that this potential impact would occur. This potential impact is further discussed in Section VII, *Hazards and Hazardous Materials*. Likewise, this potential impact and any potential mitigation measures to ensure avoidance of possible damage to buried well heads will be considered further in the EIR.

Offsite Migration of Subsurface Gasses

The foundations of new structures placed atop the abandoned oil and gas wells have the potential to force subsurface gasses from any leaking wells to migrate laterally under the building foundations or parking lots. While the extent of this migration depends greatly on

a number of factors which include the amount of gas released and the measures used to seal the foundation, this circumstance has the potential to expose sensitive receptors that would normally not be exposed.

One study (Giroux, 2001) has been performed at two Clusters to assess the potential of methane migration at the project lots. While the initial testing concluded that subsurface migration was not occurring, the two locations where testing occurred may not be indicative of other sites and therefore the collected data cannot be interpolated to the remaining sites. Additional testing (including testing for methane, soil contamination and soil gas) of the sale lots will be performed over the next few months. Because there is no current evidence supporting the presence or absence of offsite migration of subsurface gasses, this analysis assumes that the potential exists to expose sensitive receptors to substantial pollutant concentrations from offsite migration. Results of further testing will evaluate the actual significance (if any) of offsite gas migration at the sale lots both in the vertical and the horizontal offsite directions. Health hazards associated with the gas migration is further analyzed in Section VIII, *Hazards and Hazardous Materials*.

PDRGSF Operations

Future residents located nearby the PDRGSF could occasionally be exposed to elevated pollutant concentrations from emissions associated with the ongoing operations or emergency or accidental releases of gases at the PDRGSF. However, this potential impact is a baseline condition and would not be considered a project related impact. These emissions would be similar to emissions currently experienced by existing residents living close to the SCG main facility or the neighborhood well sites. The greatest potential for exposure to unintentional releases of pollutants and odors from the proposed project would be to new residents located in the neighborhoods closest to the PDRGSF, in the vicinity of Falmouth Street, 79th Street, and Veragua Street. As is discussed in item e) below, there have been reported releases of methane from the PDRGSF and it is reasonable to assume that there will be releases in the future as well.

In addition, residents could be temporarily disrupted by activities associated with California Division of Oil, Gas and Geothermal Resources (DOGGR)'s rechecking of abandoned wells prior to issuance of building permits for those lots which have unused wells beneath the ground surface.

Thus, potential methane releases resulting from PDRGSF operations do not represent an impact of on the proposed project area and will not be considered further in this study.

Two of these three potential exposure scenarios represent potentially significant impact to new residents of the sale lots. At the level of detail considered in this Initial Study these scenarios must be considered potentially significant, even though it may be possible to mitigate these impacts. Additional analysis and additional field data collection will be presented in the EIR to both quantify these impacts and develop (if necessary) suitable mitigation measures.

e) Would the project create objectionable odors affecting a substantial number of people?

It is unlikely that as a result of the sale or development of the lots, that natural gas (the principle project-related odor source) would be released. However, if the gas abandoned well were to leak during construction activities (as is discussed in item "d" above) or later during future occupation of the project lots, new and existing residents could be exposed to objectionable odors. Odors due to natural gas are primarily associated with hydrogen sulfide, which is sometimes a component of natural gas, and mercaptans, which are added to natural gas for safety purposes. Odors, while not toxic at low levels, represent a nuisance to the public. Additional field testing is currently underway to determine to what extent the projects lots represent potential odor sources.

Currently, it is not clear whether placement of new buildings on abandoned wells would cause an odor impact to nearby sensitive receptors. To this end, additional subsurface and surface testing is currently underway to identify the presence or absence of any existing migration pathways and to assist in the development of mitigation measures to reduce any resulting significant impact to a less than significant level. This potential project-related impact will be considered and analyzed further in the EIR.

Although not considered a project-related impact, new residents of the PDR lots could be exposed to natural gas through accidental or emergency releases of gas from the PDRGSF or from associated operational well heads. Currently, odors related to PDRGSF operations are reported as noticeable in the PDR area. The SCAQMD defines odors that are perceptible to more than 10 residents from any single event as a significant impact.[4] The SCAQMD has investigated 60 odor complaints (SCAQMD, 2003) at the PDRGSF since 1988. The PDRGSF does release gas on an as-needed basis from its vent systems, and experiences fugitive leaks from valves, flanges and other piping at the facility. The complaint frequency is strongest downwind of the facility during light morning on-shore breezes. The addition of new residences to the local area could cause an increase in the number sensitive receptors exposed to gas releases and the associated odors. While the development of the lots is not expected to increase the likelihood of odor releases from the PDRGSF, development would increase the number of people exposed to any objectionable odor.

In summary, while the sale of the lots is not expected to contribute to odor emissions, the sale lots themselves may represent odor sources and thus represent a potential impact. Furthermore, the addition of sensitive receptors (new residents) to the project area could expose in excess of ten additional sensitive receptors to objectionable odors. These odor impacts are considered potentially significant and will be considered and analyzed further in the EIR along with potential mitigation measures to reduce the odor impact to less than significant.

[4] Telephone conversation with Michael Krause of the SCAQMD CEQA Section, May 20, 2003.

IV. BIOLOGICAL RESOURCES

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
IV.	**BIOLOGICAL RESOURCES— Would the project:**				
a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c)	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

SUMMARY

The initial review suggests that some significant biological changes could occur as a result of the future development, thus, the project could result in present potentially significant impacts to biological resources. These impacts will be analyzed and considered in the EIR.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

Please see Appendix C for preliminary research on Biological Resources in the PDR area.

a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

If Cluster 9 of the PDR and/or the MDR lots were developed, the development could potentially affect *special status* invertebrates either directly or through habitat modifications. Special status species are defined as listed plant and animal species that receive specific protection defined in federal or state legislation (Endangered Species Act), and are formally designated as endangered, threatened or rare under state or federal legislation. Also included in this definition are species that have no formal listing status as threatened or endangered, but are regarded as locally "rare," "sensitive," or "species of concern" on the basis of adopted policies and expertise of federal, state or local resource agencies, or local organizations with acknowledged expertise, such as the California Native Plant Society (CNPS). Species that meet the criteria of Section 15380 of the California Environmental Quality Act or the California Native Plant Protection Act are defined as special status species. In general, plants constituting CNPS List 1A, 1B or 2 meet the definitions of California Department Fish and Game Code Section 1901 (Native Plant Protection Act) and/or Sections 2062 and 2067 (California Endangered Species Act), and are protected as such. Following this definition, development of any of PDR sites could adversely affect burrowing owl, however, this impact is considered less than significant. Development at any of the project sites would not affect special status plant species.

Invertebrates

Several special status invertebrate species are known to occur southwest of the PDR sites near Los Angeles International Airport (LAX). No host-plants (i.e., *Eriogonum parvifolium*) to support El Segundo butterfly, a federally endangered species, were observed at the MDR or PDR project sites.

The MDR lots support the globose dune beetle, a federal species of concern, on a small degraded central dune scrub plant community (Arnold, 2003). Portions of these lots were seeded with an ornamental non-native wildflower mix and are watered during the dry season. The introduction of non-native species, increased vegetation cover (especially on the degraded central dune scrub habitat inhabited by the beetle), and ground saturation (out of the normal rainy season period) are factors that currently affect the beetle. Future development of this site could represent a potentially significant impact to the globose dune beetle.

At the time of preparation of this Initial Study, it is unknown whether or not this potentially significant impact can be mitigated or what mitigation measures may need to be applied. Since it may be impossible to avoid impacts on this species, mitigation could involve habitat restoration or in-lieu funds to an on-going habitat restoration program within the general vicinity. This potential impact and appropriate mitigation measures will be considered further in the EIR along with consultation of regulatory agencies.

The PDR Samarkand site (Cluster 9) supports an abundance of eucalyptus trees, which potentially support the overwintering monarch butterfly, a California Department of Fish and Game special animal. "Special Animals" is a general term that refers to the California Department of Fish and Game's California Natural Diversity Data Base (CNDDB) tracks, regardless of their legal or protection status. The term does not offer further protection beyond the legal or protection status that may apply. A focused survey for monarch butterfly will be conducted in the fall. Any potentially significant impacts from future project related development on the monarch butterfly will be analyzed further in the EIR. If additional surveys indicate that the impacts are significant, consultation with local regulatory agencies will be implemented and appropriate mitigation measures developed.

Burrowing owl

Construction activities and associated noise levels due to project development at any of the PDR sites could adversely affect burrowing owls by displacing them from the sites and adjacent areas. This impact is considered less-than-significant because (1) adjacent areas near the cliffs and nearby areas of the Ballona wetlands could provide habitat for these owls, (2) the burrowing owl is not a listed endangered or threatened species, and (3) if any owls are disturbed, the number would be extremely small due to the already disturbed nature of the sites. This impact will not be considered further in the EIR.

Special status plants

No suitable habitat is present for any special status plant species due to the disturbed nature of all the project sites, including urban landscaping and grading for well installation and abandonment, and presence of invasive plant species at the PDR and MDR project sites. There are no wetlands present to support Ventura marsh milk-vetch, southern tarplant, Coulter's goldfields or Ballona cinquefoil. Although special status plant species that occupy coastal dune habitats have historically occurred within the project vicinity, these species (including San Fernando Valley spineflower, beach spectaclepod, Orcutt's pincushion, and Brand's phacelia) have low potential occurrence at the project sites. Because of the lack of suitable habitat and disturbed nature of all the project sites there is no need to consider special status plants in the EIR.

b) Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

If all project sites were developed, the development would not have a substantial adverse effect on any riparian habitat or other sensitive natural community. No riparian or other sensitive communities are present at the project sites and thus future development is unlikely to affect these communities. Southern coastal salt marsh and southern dune scrub, which are defined as sensitive communities by California Department of Fish and Game, are known to occur within the vicinity of the project sites. Southern dune scrub is found at the El Segundo Dunes just west of the runways at LAX, approximately two miles from the project area. Southern coastal salt marsh is found at the Ballona wetlands approximately

one-half mile north of the project area. A Bird Conservation area is approximately one mile northwest of the MDR project site. However, it is reported that this area does not support an important linkage for avian distribution (Los Angeles County, 1995). The project sites do not support sensitive communities. Thus, the proposed project would not impact these sensitive communities.

The proposed project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community. No significant impacts to vegetation communities are expected as a result of the proposed project. None of the lots support dominant native vegetation. All lots support-introduced species such as iceplant, English ivy, and grass.

c) Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

If all project sites were developed, the development would not have a substantial adverse effect on federally protected wetlands. There are no wetlands or jurisdictional waters present on or directly adjacent to the project lots.

d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

If all project lots were developed, the development would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites. No wildlife movement corridors are present on any of the sites and no long-term significant impacts are expected to local and/or regional wildlife movement corridors as a result of the proposed project. The proposed project would not adversely affect the ecological connectivity of the El Segundo dune ecosystem and the Ballona wetlands. None of the sites provide wildlife movement corridors to either El Segundo Dunes or the Ballona wetlands. No jurisdictional waters are present on the sites and no impacts to jurisdictional waters are expected from the proposed project.

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

If all project lots were developed, the development would not conflict with any local policies or ordinances protecting biological resources. The site on Saran Drive (Cluster 5) supports a large canyon live oak (*Quercus chrysolepis*). Since none of the lots proposed for developing are larger than one acre, a permit is not required for removal of the oak tree (City of Los Angeles, 1990). The PDR project sites are not located within the unincorporated area of Los Angeles County, thus the County Tree Ordinance (No. 11/29/99REV, amend Title 22) does not apply. Furthermore, the MDR sites, while located

within Los Angles County, contain no trees. Therefore, the reasonably foreseeable development and removal of trees would not conflict with local ordinances and no impacts would result from the proposed project.

f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

If all project sites were developed, the development would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. The sites are not contained within any adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved Habitat Plan Area, thus no impact would result to such plans.

V. CULTURAL RESOURCES

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
V.	**CULTURAL RESOURCES— Would the project:**				
a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b)	Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

SUMMARY

The initial review suggests that there is no potentially significant cultural resources impact that could not be mitigated by standard mitigation measures. These impacts and the appropriate mitigation measures will be considered in the EIR.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

Please see Appendix D for a discussion of the cultural resources in the project area.

a) Would the project cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

Development of the MDR and PDR lots would not have a substantial adverse effect on the significance of a historical resource. Although historic resources are located within a one-mile radius of the proposed project, no historic resources are located on the properties. There are no California Historical Landmarks or California Points of Historical Interest listed within a one-mile radius of the overall project area. The project would not impact a historical resource as defined in §15064.5.

b) Would the project cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5?

Development of the PDR lots would require mitigation so as to not have a substantial adverse change in the significance of an archaeological resource or disturb any human remains. Twenty-eight archaeological sites have been recorded within a one-mile radius of the project area. Of these, 23 are prehistoric archaeological sites and five are historic archaeological sites. Five of the prehistoric sites are located within the boundaries of Playa del Rey, between Gulana Avenue on the west and Hastings Avenue on the east. None of the five archaeological sites occur within known boundaries of the PDR parcels included in this project. Because none of the five documented archaeological sites occur within the PDR parcels, the proposed project would not pose an adverse impact on known cultural resources. There is, however, a high overall density of prehistoric sites recorded along the bluff south of Ballona Creek between the beach and Interstate 405 (approximately 20). Many of these sites were discovered prior to the California Environmental Quality Act (CEQA) and did not result from systematic pedestrian survey. This means that a relatively high potential for undocumented buried prehistoric cultural material still exists along the bluff. This potentially significant impact would be considered less than significant once appropriate mitigations are developed implemented in the EIR.

Development of the MDR lots would not cause a substantial adverse change in the significance of an archaeological resource or disturb any human remains. No archaeological sites have been recorded within the Marina del Rey / Venice portion of the project area. Prehistoric archaeological sites are not expected within the former Ballona Lagoon and wetlands, which were dredged and filled in 1965 to form the marina.

c) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Development of the PDR lots would require mitigation so as to not destroy any unique paleontological resource or site or unique geologic feature. The Natural History Museum of Los Angeles County Vertebrate Paleontology indicates that no fossils have ever been reported as occurring in dune sand within the United States Geological Survey (USGS) Venice 7.5 Quad. The lack of previously recorded fossil sites suggests a low potential for fossils within the project area in areas underlain by dune sand. However, as described in Appendix D, several previously recorded fossil sites occur in the Palos Verdes Sand. These occurrences indicate a high potential for fossil remains in the northern portion of the project area, which is underlain by Palos Verdes Sand. This potentially significant impact would be considered less than significant once appropriate mitigations are developed implemented in the EIR.

Development of the MDR lots would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Little or no potential for fossil remains is indicated by the geological character of the Marina del Rey / Venice portion of the project area, which is comprised of dune sand and fill materials dredged from Ballona Lagoon during construction of the marina.

d) Would the project disturb any human remains, including those interred outside of formal cemeteries?

See comments on item b) above.

VI. ENERGY

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
VI.	**ENERGY—Would the project:**				
a)	Result in a substantial increase in overall or per capita energy consumption?	☐	☐	☒	☐
b)	Increase reliance on natural gas and oil?	☐	☐	☒	☐
c)	Result in wasteful or unnecessary consumption of energy?	☐	☐	☒	☐
d)	Require or result in the construction of new sources of energy supplies or additional energy infrastructure capacity?	☐	☐	☒	☐
e)	Comply with adopted energy efficiency standards?	☐	☐	☒	☐

SUMMARY

It is not anticipated that the sale or development of the PDR and MDR lots would result in a substantial increase in consumption of energy resources. As a result, the EIR will not consider energy impacts in further detail.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

a) Would the project result in a substantial increase in overall or per capita energy consumption?

Development of the PDR and MDR lots would result in a maximum addition of 80 units. Development would consist of approximately 30 single-family units, 5 multi-family units, and one commercial building. Energy consumption can be reduced with implementation of standard energy conservation measures such as installation of ENERGY STAR®–labeled programmable thermostats with locking covers to prevent tampering with temperature settings; usage of ENERGY STAR® compact fluorescent lighting instead of incandescent lighting; installation of occupancy sensors to turn off lights when rooms are not in use; and installation of ENERGY STAR®-labeled roofing material. The average energy consumption level for the 80 units was not estimated, but is considered incremental as compared to the overall energy use of the Los Angeles area. In addition, any increase in energy demand resulting from the project has been accounted for in the City of Los Angeles and the County of Los Angeles General Plans. It is not anticipated that energy use would be substantially increased from the development of the lots. This impact would be less than significant.

b) Would the project increase reliance on natural gas and oil?

Development of the PDR and MDR lots would include primarily residential uses. The potential use of natural gas can be reduced with implementation of standard natural gas conservation measures such as installation of efficient gas furnaces (i.e., Bryan, Carrier, and Lennox energy efficient models); installation of energy-efficient refrigerators, freezers, water heaters, dishwashers, clothes washers, room air conditioners, heat pumps, furnaces, and boilers; and proper insulation. Even though the developers will determine specific appliances, efficiency measures are commonly implemented. The average increase of natural gas and oil use was not estimated, but is considered minor as compared to the overall use of the Los Angeles area. The required use is considered to be within resource availability and the impact would be less than significant.

c) Would the project result in wasteful or unnecessary consumption of energy?

Energy conservation measures will be the responsibility of the developers, owners and occupants of the MDR and PDR lots, there are programs set up to provide voluntary

incentives to avoid the unnecessary consumption of energy. One example of a program is the Green Power program, a component of the Green LA program, administered by Los Angeles Department of Water and Power (LADWP). Green power is electricity produced in an environmentally friendly manner, such as the sun, wind, and water, which are pollution free and natural. The Green Power for a Green LA program offers its customers voluntary access to green power. LADWP's residential Green Power program enables its customers to choose 100% renewable energy with 20% coming from new sources. Development is within expected growth levels and there is no reason to expect that the project will result in wasteful or unnecessary consumption of energy. This impact would be less than significant.

d) Would the project require or result in the construction of new sources of energy supplies or additional energy infrastructure capacity?

Development of the PDR and MDR lots would likely result in the construction of approximately 80 housing units. Because the lots are located in established residential communities, existing infrastructure would be available to the serve new development. Any modifications or improvements to existing energy infrastructure required to accommodate the project would be determined in consultation with the LADWP and SCG and would be subject to current installation charges. This impact would be less than significant. According to the Department of Water and Power, electricity is currently available to the surrounding residential properties, and the infrastructure for delivering electric power to the SCG lots is already in place. Existing electrical service capacity would be sufficient to accommodate development of the properties proposed for sale.

e) Would the project comply with adopted energy efficiency standards?

Efficiency measures outlined in California's 1998 Title 24 Building Energy Efficiency Standards could be implemented. Energy conservation measures will be the responsibility of the developers, owners and occupants of the MDR and PDR lots. There is no reason to expect that the project would not comply with adopted energy efficiency standards. This impact would be less than significant.

VII. GEOLOGY AND SOILS

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
VII. GEOLOGY AND SOILS—Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42)	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☒	☐	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☒	☐	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☒	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☒	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Would underlying geology produce preferential pathways for trapped subsurface gases to migrate to the surface resulting in adverse conditions and substantial risk to future residents and customers of commercial establishments?	☒	☐	☐	☐

SUMMARY

The proposed project presents potentially significant geology-related impacts, some of which can be mitigated while others need additional study. Of significance are the effects on ground shaking to future residents and how the potential ground shaking would impact the integrity of the deep gas reservoir. Additionally, the underlying geology and its ability to promote upward vertical migration of gases from beneath the site is uncertain and may be considered a significant impact. An EIR will be prepared to consider these impacts in further detail.

IMPACTS ANALYSIS

Please see Appendix E for additional information of the geology and soils conditions in the PDR.

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

This impact analysis considers impacts related to the geologic and seismic hazards that could be affected by or affect the reasonably foreseeable future development of the 36 lots and PDRGSF area. Development of the site would attract more people to the project area thereby exposing more people to hazards related to seismicity and unstable soil and slope conditions. The proposed development can affect geology by reducing natural slope stability through construction grading or could lead to additional erosion and soil loss due to construction activities.

a.i) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

The closest active fault, the Newport-Inglewood fault, is located about six miles east of the proposed project site. No portion of the proposed project site is within an Earthquake Fault Hazard Zone delineated by the Alquist-Priolo Earthquake Fault Zoning Act. This means that the occurrences of fault rupture would be considerably less at the project site than areas adjacent to fault rupture zones (See Appendix E, *Geology and Soils Background Information*). As discussed in Appendix E, the low angle Elysian Park Thrust fault lies at least 8,000 to 10,000 feet beneath the storage zone and 14 miles from the project site. Geologist refers to this type of fault as a “blind thrust” because displacement on such a fault does not generate a surface expression of fault displacement known as surface fault rupture. However, there is a component inherent in thrust faulting that could trigger faulting on other potentially active, or active, faults in the immediate region.

The project site is located in a seismically active region of California and large earthquakes could occur during the life of the project. Development of the lots and subsequent long-term occupancy could expose an increased number of people and structures to the risks of injury and property loss caused by earthquakes. However, considering the proposed project location away from an active fault trace capable of surface displacement, the risk of damage or injury directly related to surface fault rupture is low and the impact is less than significant.

a.ii) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

The numerous active earthquake faults within 50 miles of the project area will continue to subject the southwestern Los Angeles Basin and the project area to strong seismic shaking during large earthquakes. Earthquakes are unavoidable and will occur throughout the useful life of the project. Earthquakes in the region could generate long duration ground shaking capable of causing injury and severe structural damage. The potential for activity on a blind thrust is possible and if it were to occur, the ground motion could be higher than

some buildings could tolerate. Earthquakes that generate strong ground shaking could trigger movement on other nearby fault zones.

The impact of the seismic motion to the former oil reservoir and PDRGSF area is uncertain considering that sudden changes in the underlying geology, such as bedrock fractures, could develop preferential gas migration to the surface, especially through unabandoned, abandoned, or unknown well casings. Historical information indicates that earthquakes can damage gas wells. Strong ground shaking can also damage exiting and abandoned oil and gas wells causing a conduit to open for gas to escape to the surface.

Future development of the 36 lots would require earthwork and geotechnical studies to assure adequate protection against seismic shaking. All construction would incorporate the 1997 Uniform Building Code that requires that all structural designs account for site-specific earthquake ground motion. Given the uncertainty surrounding the potential adverse effects of a major earthquake on the geology underlying the project site and the potential for upward migration of gases, this would be a potentially significant impact that will be considered and analyzed further in the EIR.

a.iii) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

Young dune sand and lagoon sediments underlie the MDR area over a shallow, tidally influenced groundwater table. This area is located in an area delineated by the State of California as a Seismic Hazard Zone for liquefaction. Liquefaction hazard at the PDR sites is low due to the location and underlying geology. The materials in this area, namely saturated sands and coarse grain lagoon sediments could fail and liquefy during a major earthquake. Areas within a designated Seismic Hazard Zone must undergo prescribed evaluation and mitigation prior to development. Given that a potential liquefaction hazard could directly impact the MDR development and that under most cases, liquefaction hazards can be mitigated, this would be considered less than significant once appropriate mitigation is implemented. This impact will be considered and analyzed further in the EIR.

a.iv) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

Slope failure can occur when construction grading, such as hillside cuts, alter natural slopes and reduce their stability. There are no significant slope stability concerns areas associated with the sale of the lots, however, slope stability may be an issue for some sites if they are eventually developed. Lots in Clusters 10, 11 and 12 contain slopes and could be susceptible to slope instability. The remaining lots are on relatively level ground. New construction will require geotechnical surveys that will recommend measures to prevent slope failure that could occur with or without a severe seismic shaking event. This is required for adjacent residential developments. Proper geotechnical investigations and analysis using standard geotechnical and geologic techniques specified in the Uniform

Building Code would reduce the potential for slope failures and ensure impacts are less than significant. Code-required measures are not considered mitigation.

b) Would the project result in substantial soil erosion or the loss of topsoil?

The shallow (within a few feet of the ground surface) soil, alluvium, and bedrock formations underlying the project will have varying susceptibility to soil erosion due to their unconsolidated nature and/or level of compaction. Running water and steep slopes are the primary components that trigger erosion of unprotected soil surfaces. The development of the properties in the southern portion of the project area will result in minor erosion-related impacts because this area is relatively flat and level. In the northeastern hilly areas, there is a potential for severe erosion if construction is concentrated on unprotected surfaces (i.e. bare surface soil).

The City and County of Los Angeles require site grading and earthmoving projects to comply with the Department of Public requirements and the procedures outlined in the County Hydrology Manual to avoid erosion and loss of topsoil. These requirements and procedures include the development of Best Management Practices to reduce erosion and sedimentation. As discussed in Appendix G, *Hydrology and Water Quality Background Information*, the NPDES permitting program, as implemented by the State of California, addresses measures to reduce sedimentation and erosion in storm water discharges for construction activities. Examples of protection measures include diversion dikes, silt fences, sediment traps or sediment basins, and mulching. Compliance with local grading codes, the NPDES process, and required runoff controls for construction, such as Best Management Practices, will minimize soil erosion in susceptible areas to less than significant.

c) Would the project be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Liquefaction is discussed in (a.iii) above. Landslides are discussed in (a.iv), above. There is some limited potential for slope instability in natural slopes that could fail due to static or earthquake-induced forces. In other areas, development requiring new cut slopes, road building, grading of terraces could reduce the overall stability of natural slopes leading to slope failure. Slope failure is only a potential on lots within Clusters 10, 11, and 12. In addition, soil in the project area may be moderately to highly expansive and certain alluvial soils may be porous and subject to consolidation under building loads. Standard geotechnical design standards and practices, as contained in the 1997 Uniform Building Code, would compensate for adverse slope stability and soil conditions. Implementation of standard engineering practices and application of the 1997 UBC would reduce to less than significant impacts related to existing weak or collapsible soils or slope instability conditions caused by development. Ground subsidence that causes large areas of the ground surface to settle beyond what a building can tolerate is not anticipated under this

proposed project. These potential impacts would be less than significant with mitigation and will be evaluated further in the EIR.

d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

See c) above. There may be portions of the development area that could contain expansive soils. Adverse effects due to expansive soils, such as those that could damage a building foundation or road, can be overcome by adequate investigation and engineering design. For this reason, expansive soils would be less than significant assuming properly implemented mitigation. The EIR will evaluate this issue further.

e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

New development would be required to tie into the municipal sewer and therefore would not require septic systems. Therefore, there would be no impact.

f) Would underlying geology produce preferential pathways for trapped subsurface gases to migrate to the surface resulting in adverse conditions and substantial risk to future residents and customers of commercial establishments?

The information presented in Appendix F *(Geology and Soils Background Information*) and Appendix G (*Hazards and Hazardous Materials Background Information*) provides information and data regarding the possibility of subsurface gas leakage from several different sources.[5] Subsurface gas can reach the surface through man-made conduits such as existing wells or through natural pathways caused by the underlying geology.

Man-made structures that could potentially transmit subsurface gas include old, oil and gas wells that were abandoned prior to DOGGR regulations, undocumented gas monitoring wells, dry holes, water extraction and monitoring wells, and oil and gas wells recently abandoned under DOGGR permit regulations. Once penetrated, a poorly constructed or abandoned well can serve as a conduit for upward migration of natural gas. Such conduits can develop as old wells deteriorate (over the 70 years); even when proper construction and abandonment methods have been applied. One potential pathway for gas migration is through the materials (construction debris, telephone poles) that were used to abandon wells and dry holes during the development and operation of the Playa Del Rey Oilfield in the 1930s and 1940s. Gas can also migrate to the surface through concrete seals and

[5] The three types of gas that may exist within the geological and soil units underlying the project area are processed natural gas (or piped gas), biogenic (or swamp) gas, and thermogenic (field) gas. Biogenic gas is primarily methane with carbon dioxide and sulfide gases resulting from decomposition of organic material in former lagoon deposits or other sources. Thermogenic gas is generated at depth, when increased temperatures and pressures alter organic material. It includes a broad range of gas components (methane, propane, butane, ethane, etc.). In contrast, processed natural gas is primarily methane remaining from thermogenic gas after most of the heavier gas components are removed (usually less than 0.1% heavy thermogenic hydrocarbons).

around casings of existing gas wells due to inadequate or deteriorating concrete seals, casing corrosion, fluctuating gas pressures and high temperatures. Once a well is abandoned, the casing is blocked making it impossible to determine well integrity by intrusion. Air and soil gas sampling are reliable methods to determine the integrity of an abandoned well. DOGGR has established guidelines for well abandonment, which includes development restrictions for areas where test data shows abandoned wells may be leaking, i.e. methane is detected in air samples.

Natural subsurface geology can contribute to upward gas migration through faults, permeable alluvial deposits, fault planes, structural discontinuities (fractures and joints) and aquifers. Earthquakes from the various southern California faults in the project vicinity can damage well seals or casings at depths generating new preferential pathways that lead to gas leakage. Gas from shallow sources can also migrate through younger geologic sediments that have permeable horizons and zones. However, in general, geologic pathways are relatively compacted in the shallow and storage zones because fractures, faults, and spaces between individual grains are reduced due to the weight of the overburden rock materials. Previous geologic studies conducted by SCG, DOGGR, the U.S. Geological Survey (USGS), and the California Geological Survey (CGS) indicate that faults are present in the PDRGSF area. However, the information and reports do not present conclusive evidence that active faults (those that have been active in the last 11,000 years) capable of surface rupture pass through the project vicinity. The Compton “Blind Trust” fault passes beneath the site but at depths greater than 20,000 feet. Blind thrust faults, although not expected to cause surface rupture, could cause ground shaking capable of causing well damage. No faults are reported to cut through the Storage Zone. The Charnock fault is considered potentially active (documented activity in the past 1.6 million years) and crosses the northeastern edge of the PDRGSF. Other smaller faults and fracture systems are inferred in various units of the Storage Zone within the Playa del Rey Field.

SCG reported incidents and the ETI (2000) soil gas survey results suggest the possible presence of migration pathways from the gas storage reservoir to the ground surface. This indicates that migration pathways may also be present elsewhere in the area of influence of the PDRGSF. Those pathways of greatest immediate concern are man-made: abandoned wells, which provide conduits for rapid vertical migration of gas to the surface. Natural (geologic) pathways may also transmit gas, but more slowly with the possibility of creating more regional surface gas problems.

Potential adverse project impacts are associated with exposure of people and structures to accumulation of subsurface soil gas in residential areas as a result of the proposed development. Although this potential currently exists, proposed development may expose more people and property to soil gas leakage if it were to occur through man-made structures, existing geologic structure, or as a result of a seismic event. A field study is currently underway to collect additional data on the potential of subsurface gas leakage. This is a potentially significant impact and will be considered and analyzed further in the EIR

VIII. HAZARDS AND HAZARDOUS MATERIALS

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
VIII.	**HAZARDS AND HAZARDOUS MATERIALS—Would the project:**				
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☒	☐	☐	☐
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☒	☐	☐	☐
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

SUMMARY

The proposed project could pose potentially significant hazard impacts. These include the potential for exposure to gas leaking from abandoned wells by new residents located on the divested properties and/or potential effects from accidental releases of hazardous substance when construction activities occur on the properties. Existing reports that describe monitoring programs for hazardous substances at the project sites do not provide sufficient information to determine if hazards presently exist. The measurement data are also not sufficient to determine if

sale of the lots would result in significant impacts, and if the hazards impacts from potential development on the project sites may be significant.

A comprehensive measurement program must be undertaken to better characterize the extent of contamination at or near the identified lots. That analysis and the assessment of human health impacts will be reported in an EIR.

HAZARDOUS MATERIALS/WASTES

As part of the existing environment, hazardous materials and wastes may be encountered at each of the abandoned and operating gas wells within the surrounding residential community. Hydrogen sulfide (H_2S) and other odorous substances, such as methyl mercaptan, benzene, as well as other aromatic hydrocarbons, are all byproducts of natural gas production. These toxins may be present at active or abandoned wells. The impacts that these substances have on properties to be divested are discussed in the impact analysis below. SCG follows standard operating procedures that are prescribed to regulate the storage, clean up, and disposal of hazardous materials and wastes at their sites. These procedures are contained in both the Hazardous Materials Business Plan and the Hazardous Waste Contingency Plan.

GAS MIGRATION

SCG has operated the PDRGSF since 1942, and the twelve wells associated with the proposed sale of the 36 lots have been abandoned according to abandonment regulations. Giroux and Associates conducted a limited gas migration study in July 2001, at two abandoned wells that were assumed to be representative of the two areas where wells are located, the LorMar site (Cluster 3) and the Troxel site (Cluster 12), where gas leakage was monitored around an abandoned well on each site. The LorMar well is on top of PDR Mesa, and the Troxel well is located in beach sand at MDR. Probes were inserted into the soil around each well to measure methane gas. However, there was no methane detected at the LorMar well, indicating that there is no leaking gas.

At the Troxel site, there were initially levels of methane measured at four of the probes that were located 5 feet and 10 feet from the well head. However, the levels decreased to below detection limits after about four days of monitoring. If there were underground gas migration, there would initially be a gradual rise in methane levels until steady-state conditions would be reached, and the level would then remain relatively constant. During steady-state, the loss through the soil and to the air would be replenished with new gas from a leaking well. Because the monitoring showed a sharp decline in methane levels with time, there is probably no leaking gas, but the initial measured level might have been the result of drilling into old spilled oil that dissipated with time. If the well were leaking, there would be replenishment of the gas with time.

Since there was no steady-state level of gas measured at either site, there was no indication of any gas migration at either monitoring site. Since the two tests may not sufficiently characterize all of the abandoned wells, further testing is being performed for consideration in the EIR, prior to sale of the lots.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

Please see Appendix F for an extensive background analysis of hazardous materials.

Sale of the lots assumes that the properties are sold in their existing conditions and that potential hazards impacts would be the result of gas leaks and migration to new residents from the existing wells.

a) Would the project create a significant hazard to the routine transport, use, or disposal of hazardous materials?

The proposed project and expected future development will not involve the routine transport, use or disposal of hazardous materials and thus there is no project-related impact.

b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

The types of hazards that can occur from upset or accident conditions relates to potential explosions or exposure to high levels of toxic air contaminants (TACs) in the gas. These compounds include aromatic hydrocarbons, such as benzene, that are present in the gas.

Risk of Explosion

The generation, transmission, and distribution of natural gas may pose a risk of explosion. Natural gas has a flammable property that needs to be strictly regulated in order to reduce the risk of explosion to the public and the environment. Explosion can occur as a result of leakage from existing and abandoned gas wells and gas lines, and/or from third party interaction with the wells, transmission lines, and distribution lines. Distribution lines extend out from the main facility to the surrounding community. These lines are located underneath the community roads and sidewalks. If new residences are built on the divested properties there may be gas leakage from abandoned wells into the buildings and leading to possible explosions. This would be a potentially significant impact. Further study on methane gas migration is being undertaken, and the results reported in an EIR to assess the significance of impacts and possible mitigation measures.

Details of a field sampling plan are described in the referenced report (Methane Specialists and Sullivan Consulting Group, 2003). This sampling program will determine potential migration of gas near abandoned wells at the divested properties and the potential for explosion conditions. The significance of the impacts will be reported in an EIR.

In addition, releases of gas from the abandoned wells may occur if construction activities on the sale lots accidentally puncture an abandoned well, leading to a possible explosion.

Further analysis should be done on the abandoned wells, and safety precautions should be established to ensure that accidents do not occur during construction activities.

Risk of Toxic Air Contaminates

There is a possible risk of contracting cancer or noncancer health effects by residents at the sale lots from exposure to Toxic Air Contaminants (TACs) released from abandoned wells and lines. These compounds include aromatic hydrocarbons, such as benzene, that are present in the gas. Limited monitoring for gas leaks at the facility, including at abandoned wells, under normal operations has shown no significant hazard to the public or the environment. The following is a brief discussion of these TACs:

Natural Gas is normally odorless. There is a potential for natural gas to leak from the gas storage facility through various conduits, such as leaking gas wells and transmission lines. In the past, SCG injected an odorant into the gas storage zone in order to detect any leaks. Currently, there is enough detectable odorant within the storage zone that SCG injects the odorant directly into the distribution lines. The odorant that SCG uses is composed of either 100% Thiophane (Tetrahydro-thiophene) or a 50/50 blend of Thiophane and Tertiary-butyl-Mercaptan. The odorant injected is also less than 1 part per million (ppm) of each compound within the storage zone gas.

Thiophane is a flammable yellow liquid that supplies a noxious odor. There have been several studies done on this compound. As a result of the studies performed, the following information has been identified.

Thiophane is <u>not</u> listed by the American Conference of Governmental Industrial Hygienists (ACGIH), International Agency for Research on Cancer (IARC), National Institute for Occupational Safety and Health (NIOSH), or Occupational Safety and Health Administration (OSHA) as a carcinogen. The compound does have an LC50 by inhalation within a mouse of 27 gm/m3/2H. An LC50 value is the concentration of a material in air that will kill 50% of the test subjects when administered as a single exposure. The value gives information regarding an idea of the relative toxicity of the material. Comparing the LC50 of the Thiophane to the amount injected in the odorant shows that the injected amount is too small to create a significant health effect to the public or the environment. Thiophane does not contain any hazardous air pollutants or ozone depletors under the Clean Air Act. Thiophane is not listed as a hazardous substance, a priority pollutant, or a toxic pollutant under the Clean Water Act. OSHA considers none of the chemicals in this substance highly hazardous. Thiophane can be found on the State of California No Significant Risk Level right to know list.

Tert-Butyl Mercaptan is a flammable, clear, colorless liquid, which supplies a skunk-like stench. There have been several studies done on this compound. As a result of the studies performed, the following information has been identified.

T-butyl Mercaptan is not listed by ACGIH, IARC, NIOSH, OSHA, or the National Toxicology Program (NTP) as a carcinogen. The compound does have an LC50 by inhalation within a mouse of 16500 ppm/4H[6] and within a rat of 22200 ppm/4H. The LC 50 numbers when compared to the 1 ppm injected into the storage gas show that the injected amount is too small to create a significant health effect to the public or the environment. The compound is not designated a hazardous air pollutant or ozone depletor under the Clean Air Act. T-butyl Mercaptan can be found on the State of California No Significant Risk Level right to know list.

Hydrogen sulfide (H_2S) is produced in nature primarily through the decomposition of organic material by anaerobic bacteria. H_2S develops within stagnant anaerobic areas such as swamps, and naturally as a constituent of natural gas or petroleum. H_2S is a colorless, flammable and toxic gas that has a noxious odor. At first contact the odor smells like rotten eggs, however the sense of smell is lost after 2-15 minutes of exposure making it difficult to detect dangerous concentrations. The OSHA ceiling for H_2S is 20 ppm and the ACGIH Short-Term Exposure Level is 15 ppm. The compound has an oral LD50 within a rat of 175 mg/kg. The LD50 test evaluates acute lethality from exposure to a substance or product. Similar to the LC50, the LD50 is the dose at which 50 percent of the test animals can be expected to die. Hydrogen Sulfide is not listed by OSHA, IARC, NTP, or ACGIH as a carcinogen.

Hydrogen sulfide can be released to the environment through two different conduits within the operating facility. H_2S can vent from the oil water separator during extraction of gas from the storage facility. It can also be released from the monitoring and liquid extraction wells. Any exposure level of H_2S released into the environment that exceeds safety standards set by OSHA or ACGIH would be a significant impact. Giroux & Associates has conducted air sampling to determine the presence (if any) of H_2S in the project area as a result of the facility operations. A detailed examination of the findings and impacts is discussed in Section III, *Air Quality*. Since these data are inconclusive, an additional monitoring program will be carried out to determine potential exposure levels of hydrogen sulfide (Methane Specialists and Sullivan Consulting, 2003). The program is geared to measure both methane and hydrogen sulfide leakage from the abandoned wells and from other locations impacted on the sale lots.

A common by-product of gas and oil production is **Benzene and other volatile organic compounds**. Benzene is one of the most toxic of the aromatic hydrocarbons and therefore will be the focus of this impact analysis. Benzene is a common chemical that the public is exposed to each day. It is located within gasoline and vented into the atmosphere in small quantities at the local gas station. It is contained within cigarettes and exposes the average smoker to an increased amount, as opposed to the average nonsmoker. It is also released from cars while they are warming up or sitting idle.

6 The value shown represents the combination of dose and duration. In this case it is 16500 parts per million over 4 hours (i.e., 4H).

Benzene is an A1-confirmed carcinogen in humans according to ACGIH, an occupational carcinogen according to NIOSH, a known carcinogen according to NTP, a select carcinogen according to OSHA, a group 1 carcinogen according to IARC, and a carcinogen according to the state of California. The inhaled LC50 is 9,980 ppm in mice and 10,000 ppm/7H in rats. Benzene is listed as a hazardous air pollutant under the Clean Air Act. Benzene is listed as a hazardous substance, a priority pollutant, and a toxic pollutant under the Clean Water Act.

The OSHA Permissible Exposure Limit (PEL) for benzene is 1 ppm and the ACGIH Short-Term Exposure Level for benzene is 5 ppm. Because benzene can still be harmful at this level, ACGIH has recommended a threshold limit of 0.5 ppm and NIOSH has set a recommended exposure limit at 0.1 ppm.

Benzene could be released as a result of leaking abandoned well.

Discussion of Risks

As no Health Risk Assessment (HRA) was available specific to the proposed project, an examination was made of an HRA prepared for the nearby Playa Vista Project, which is located near the PDR sites (Kleinfelder, 2001). The Kleinfelder HRA relied on over 1,000 soil gas samples that were analyzed for methane and the toxic vapors: benzene, ethyl benzene, and xylenes (BTEX) and for hydrogen sulfide. The HRA reported that maximum methane concentrations were very high and were well above explosive limits. However, the HRA did not evaluate the potential for explosions. It did evaluate the health risks from potential exposure to TACs, BTEX and hydrogen sulfide.

The Kleinfelder HRA estimated maximum impacts by incorporating the measured soil gas concentrations of TACs into a model that simulates the transport of toxic gases to indoor spaces located near the source of contamination (Johnson Ettinger model). The model showed that the maximum cancer risk from exposure to soil gas was estimated to be 7×10^{-9} for average soil gas concentrations and 1×10^{-7} for maximum soil gas concentrations. These cancer risks are well below the 1×10^{-6} cancer risk considered to be acceptable by regulatory agencies and which do not require remediation. This HRA implies that the health risks to future residences on all of the sold properties would be less than significant. However, the HRA was based on a limited set of measurements, and there may not be sufficient measurement data to adequately characterize the spatial and temporal distribution of toxic gases at the property sites. In addition, further investigation is being conducted to determine if methane levels could reach explosive levels at some of the divested properties, as was indicated in the HRA. When new field data has been collected and analyzed, an HRA will be prepared for the proposed project and considered in the EIR.

To better quantify ambient air levels of TACs throughout the parcel locations, a meteorological monitoring and continuous ambient air monitoring program for methane and total hydrocarbons was conducted for one year (September 2000 to September 2001) at two locations (URS, 2002). The mean concentration of the monitoring results for methane

was very low (about 3 ppm), indicating that ambient levels are at about background levels for the Los Angeles region. The peak short-term level was 14 ppm, which is below health levels, and well below safety levels. However, because the measurements only covered two locations and may not have been located where maximum impacts from potential leaks might be occurring there is not sufficient information to eliminate a possible significant hazard to the public or the environment.

There is insufficient data in these studies (Kleinfelder HRA and URS air monitoring data) to conclude that there would be no significant health risks to residents located on the properties after sale of these properties, and additional monitoring and analysis is being conducted to determine if there may be significant impacts. The additional monitoring is designed to further characterize shallow subsurface soil vapor and soil quality below the 36 lots, all of which are located at or near the 12 abandoned oil and gas wells. Details of a monitoring program are described in a report by Brown and Caldwell (Brown and Caldwell, 2003). The data obtained from the monitoring program will then be incorporated in a follow-up exposure HRA and the significance of the impacts and potential mitigation measures will be reported in the EIR. Until this analysis is complete, this impact is considered potentially significant.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Any natural gas leaking from the abandoned wells could release TACs to the environment as described in impact b) above. These releases could be the result of possible accidents that might occur during construction on the properties or potential well leaks over time. The releases could migrate along air currents to nearby schools. All of the PDR lots are located less than 0.25 miles away from at least one of the three local schools:

- Westchester High School
- Paseo del Rey Elementary School
- St. Bernard High School

Note that Cluster 12 located in the MDR area is not located within 0.25 miles of any school. Additional analysis is needed to determine the potential for exposure of TACs at nearby schools, and how the project would cause those releases. The methods for the analysis are described above under impacts a) and b). This is a potentially significant impact and will be considered further the EIR.

d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Neither the PDR nor MDR sale lots are not contained on the list of hazardous materials sites (Cortese) that are subject to Government Code Section 659062.5, and, as a result,

would not create a significant hazard to the public or environment. Thus, there is no impact from the proposed project on this criteria and it will not be considered further in the EIR.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

The MDR lots are not located within two miles of a public airport and would not pose a safety hazard. Several of the PDR lots are within 0.75 miles of the northern most runway of Los Angeles International Airport. However, the nature of the project and the expected future development of the PDR sale lots would not pose a safety hazard. This impact will not be considered further in the EIR.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

The lots are not within two miles of an existing public or private airstrip and therefore will not create an impact that would require mitigation. This impact will not be considered further in the EIR.

g) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The sale and future development of the lots may eliminate these locations from the SCG Emergency Response Plan that covers their remaining facilities. In that case, a new emergency response plan that addresses these locations would have to be developed. Additional analyses are needed in an EIR to determine if the project will interfere with adopted emergency response plans or as a mitigation measure, a new emergency response plan would be required to be prepared.

h) Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

The project is not located in an area subject to wildfires. The impact would not be significant, will not require mitigation and will not be considered further in the EIR.

IX. HYDROLOGY AND WATER QUALITY

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
IX.	**HYDROLOGY AND WATER QUALITY— Would the project:**				
a)	Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion of siltation on- or off-site?	☐	☐	☒	☐
d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e)	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f)	Otherwise substantially degrade water quality?	☐	☒	☐	☐
g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☒	☐
h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j)	Inundation of seiche, tsunami, or mudflow?	☐	☐	☒	☐

SUMMARY

No potentially significant impacts to hydrology or water quality would result from the sale or development of the properties. If each lot is developed independently, construction activities not

subject to best management practices[7] as designed in a Storm Water Pollution Prevention Plan (SWPPP) could result in temporary, cumulatively water quality impacts to the local receiving water, Ballona Wetlands. No significant long-term impact to water quality is anticipated from the increased development. This impact will be considered in greater detail in an EIR.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

Please see Appendix G for background information on Hydrology and Water Quality.

a) Would the project violate any water quality standards or waste discharge requirements?

Development of the lots would not violate water quality standards or waste discharge requirements. Each lot is covered under the Municipal Separate Storm Sewer (MS4s) National Pollutant Discharge Elimination System (NPDES) permit held by the County of Los Angeles, the purpose of which is to reduce the discharge of pollutants from MS4s to the maximum extent practicable. In addition, development of the lots could be subject to Phase II NPDES storm water regulations for construction activities, which apply when there is soil disturbance of one to five acres, or if less than one acre, is part of a larger common plan of development one acre or greater. Since the lots are each less than one acre, they would not be subject to the statewide General Construction Storm Water NPDES permit requirements if they were developed separately. However, multiple lots developed at the same time such that the soil disturbance would add up to more than one acre would be required to obtain a Storm Water Pollution Prevention Plan (SWPPP) for coverage under the statewide construction storm water permit. Complying with state requirements to obtain coverage under the statewide storm water permit would ensure that no impact to water quality standards or applicable waste discharge requirements would occur.

Since the PDR lots drain indirectly to Ballona Wetlands, development on each individual property may be subject to the Los Angeles Regional Water Quality Control Board (LARWQCB) Standard Urban Storm Water Mitigation Plan (SUSWMP) requirements due to the designated sensitive ecological status of the wetlands. However, finalization of the threshold requiring SUSWMP compliance has not been finalized yet. Implementation of a SUSWMP for each site would ensure that storm water runoff rates from each site would not be increased by development, and that urban runoff pollution would be minimized. This would require providing detention basins and potentially treatment systems to capture, reduce flow velocity, and treat the first ¾ inch of each storm according the LARWQCB requirements. Compliance with the SUSWMP requirements, if applicable, would ensure that storm water runoff would not violate water quality standards or applicable waste discharge requirements.

7 See http://www.swrcb.ca.gov/

b) Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Development of residences on each lot could slightly reduce percolation of storm water into the groundwater basin. However, the PDR lots likely do not contribute a significant source of percolation due to their location on the bluff, which rises approximately 150 feet above surrounding areas. Water that infiltrates through the pervious surfaces on the lots would not likely contribute to significant recharge of the regional aquifer, which is more than 150 feet below the bluff. Therefore, the infill development of these individual lots would not significantly interfere with groundwater recharge or affect groundwater supplies.

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion of siltation on- or off-site?

Development of the lots could modify drainage patterns on each lot. However, no streams or rivers exist on the sites, so none would be altered. Development would not substantially increase future erosion potential, assuming that most residences would be landscaped post-development to avoid exposed soils that would be subject to erosion. The project would not result in substantial erosion or alter the course of a stream or river.

d) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?

The PDR and MDR lots are each within already established residential neighborhoods. Development of the lots would not alter a stream or river. The infill development would add a small amount of additional impervious surface to an already urbanized residential area. However, the total amount of storm water runoff in the street gutter drainage system would not substantially increase. Furthermore, the infill development would occur on existing lots that have a street drainage system adequate to accommodate the 50-year storm pursuant to the City Department of Public Works design standard for the residential neighborhood. Development would not significantly increase flood risk.

e) Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Development on the PDR and MDR lots could increase impervious surfaces (driveways, sidewalks, etc) on each lot. This could slightly increase storm water runoff. The infill development would occur in neighborhoods that have a street drainage system designed to

accommodate the 50-year storm pursuant to the City or County Department of Public Works design standard. Prior to obtaining a building permit, developers would be required to prepare a drainage plan for each site attached with the building permit application. The City or County would approve each site's drainage plan prior to construction. No impact to the existing storm water drainage system would occur. Furthermore, development of the sites with residential uses would not be a source of substantial additional amounts of polluted runoff.

f) Would the project otherwise substantially degrade water quality?

Construction on the lots could produce pollutants that would have the potential to temporarily degrade the quality of receiving waters if not properly managed. The primary pollution of concern is sediment that results from excessive erosion of disturbed soils. Other potential pollutants include metals, pesticides, nutrients and soil additives, construction chemicals and fuel, and miscellaneous waste. No significant long-term impact to water quality is anticipated from construction activities.

Development would be required to comply with all applicable regulations to protect water quality. Construction on the lots could be subject to Phase II NPDES storm water regulations for construction activities, which apply when there is soil disturbance of one to five acres, or if less than one acre, is part of a larger common plan of development one acre or greater. Each individual site is less than one acre. Therefore, depending on when each site is developed, construction may or may not be subject to this regulation. If the sites are developed simultaneously and soil disturbance is greater than one acre, the developer would be required to prepare a SWPPP to minimize pollutants in runoff from the site. If the sites were developed individually, the regulations would not require a SWPPP to be prepared. Pollutants in runoff would not be considered a potentially significant impact to water quality due to the small size of the projects individually.

Once constructed, the development of the lots in either neighborhood would not substantially degrade water quality. Although landscaping could increase pesticide and fertilizer usage on the sites, the infill development would not substantially alter the existing residential nature of the two neighborhoods or the quality or character of the runoff. The contribution to urban runoff from each lot would be minimal. The PDR lots could be subject to SUSWMP requirements since storm water runoff from the area drains into the Ballona Wetlands, listed as an environmentally sensitive area. However, the requirements for environmentally sensitive areas have yet to be finalized by the LARWQCB. If required to comply with the SUSWMP, the developer would be required to implement source control BMPs as mitigation measures to reduce potential pollutants and/or storm water treatment systems to remove pollutants to ensure that development would not degrade water quality. No significant long-term impact to water quality is anticipated from the increased development.

g) Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

The PDR lots are not located within a designated flood plain. Development in these lots would not place housing in a flood plain. The MDR lots are directly on the beach within the 100-year flood plain. Development on these two parcels would be subject to City requirements regarding development within a flood plain. The floor of any habitable space would need to be at least one foot above the base flood elevation. Design and construction of the structures would be subject to City approval. As such, the City-approved infill development in the existing neighborhoods located in a flood plain would not be considered a significant impact.

h) Would the project place within a 100-year flood hazard area structures, which would impede or redirect flood flows?

The PDR lots are not located within a designated flood plain. Development in these lots would not place housing in a flood plain. The MDR lots are directly on the beach within the 100-year flood plain. Development on these two parcels would alter the flood plain slightly, requiring a letter of flood plain revision to be submitted to the Federal Emergency Management Agency. The development would need to be designed to avoid modifying the flood plain in a way that would impact neighboring structures. Designs would require City approval to ensure that flood flows would not adversely affect neighboring structures. As such, the City-approved infill development in the existing neighborhoods located in a flood plain would not be considered a significant impact.

i) Would the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

The PDR lots are not located within a designated inundation area as noted in the City of Los Angeles' General Plan Framework. The MDR lots are directly on the beach within the 100-year flood plain and potential inundation area. Development within inundation areas requires City approval. The risk of dam failure and inundation is minimal. The City-approved infill development in the existing neighborhoods is located in a potential inundation area that would not be considered to have a significant impact.

j) Would the project expose people or structures to a significant risk of loss, injury or death involving inundation of seiche, tsunami, or mudflow?

The PDR lots are not located within a tsunami or risk area. Some sites are located near steep inclines and cliff faces that could produce mudflows. The MDR lots are each located within the City-designated tsunami risk zone. Given the standard conditions set forth in the City of Los Angeles Flood Hazard Specific Plan providing development requirements, and the rare occurrence of such an event, the impact is considered less than significant.

X. LAND USE AND PLANNING

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
X.	**LAND USE AND PLANNING— Would the project:**				
a)	Physically divide an established community?	☐	☐	☐	☒
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

SUMMARY

No impacts to land use and planning would occur from the proposed project. This topic will not be considered further in the EIR.

IMPACTS ANALYSIS

Please see Appendix H for additional information on land use.

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

a) Would the project physically divide an established community?

The development of the lots would not likely involve a new major road or highway. Any development project would not physically divide an established community; rather it would join the community of PDR. Therefore, there would be no land use impact as a result of the development of the PDR and MDR lots.

b) Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Potential exists for approximately 80 new dwelling units to be constructed on all the lots proposed for sale. It is assumed that development would be required to follow the City and County of Los Angeles General Plans guidelines, current zoning ordinance, and community plans and specific plans, and therefore, there would be no conflict with any land use plans or policies.

There are 30 PDR lots zoned low density residential. Three lots in PDR are zoned medium density residential use, which allows 24 to 40 dwelling units per gross acre. One lot in the PDR area is zoned for commercial use, but could accommodate a single or two family dwelling or apartment house within an enclosed building. The two medium density residential zoned lots located in MDR are zoned multi-family residential in an established area for apartments.

c) Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?

Currently no local or community conservation plans apply to the lots in either PDR or MDR, and development of the lots would not conflict with any habitat conservation plan or natural community conservation plan.

XI. MINERAL RESOURCES

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XI.	**MINERAL RESOURCES—Would the project:**				
a)	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b)	Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

SUMMARY

The proposed project would have no impact on mineral resources, as SCG would retain the right to any subsurface mineral resources and already has access to those present. Therefore, impacts to mineral resources will not be considered further in the EIR.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

a) Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

See b) below for discussion.

b) Would the project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

The sale of the PRD and MDR lots would involve only the transfer of surface rights and would not carry with it any action to develop the lots. The primary mineral resource that could be affected by the sale would be the sub-surface mineral rights. Per the proposed sale agreement, SCG would retain these rights after the sale. Therefore, there would be no impact from the sale of the lots.

Development of the lots would only involve surface grading and digging to establish footings for buildings. No loss of mineral resources would result from this activity. As with the sale of the lots, development of the lots would not result in any significant impacts from loss of subsurface mineral resources or access to important mineral resources as there would be no loss of such resources from the development of the lots. Furthermore, SCG would retain future mineral rights after the development.

XII. NOISE

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XII.	**NOISE—Would the project result in:**				
a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☒	☐	☐	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☒	☐	☐	☐
f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

SUMMARY

The proposed project presents a number of potentially significant noise impacts. These impacts will be analyzed and considered further in the EIR.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

Please see Appendix I for an extensive background analysis of noise.

a) Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Development of the 36 lots could lead to increased noise levels in the area that could affect existing land uses during construction and post-construction. Construction noise levels at and near locations on the project site would fluctuate depending on the particular type, number, and duration of use of various types of construction equipment. The effect of construction noise would depend upon how much noise would be generated by construction, the distance between construction activities and the nearest noise-sensitive uses, and the existing noise levels at those uses. One lot is zoned commercial and typical noise levels generated by construction of commercial buildings range from 84 dBA during ground clearing to 105 dBA during pile driving. These noise levels would be in excess of the City's noise ordinance standards discussed in Appendix I.

Monitored noise levels in the area range from 51 dBA in the "acceptable" category to 73 dBA in the "unacceptable" category for residential uses. Therefore the project could lead to a potentially significant impact by introducing additional noise sources (additional residences and increased traffic) in the local environment.

Hence, development of the residential lots and one commercial lot would constitute a potentially significant impact. Even so, mitigation measures to reduce these impacts could be implemented by the developers to comply with local noise ordinances, and result in a less than significant impact. The potential for noise in excess of the City's noise ordinance is short term during construction activities only. This impact will not occur during normal residential occupations. This impact will be considered and analyzed further in the EIR.

b) Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Sensitive receptors, primarily the adjacent residential dwellings, would experience minimal ground-borne vibration during construction. However, since the duration of this impact would be short-term and since construction activities would be subject to the requirements of the City's noise ordinance, this impact would be considered to be less than significant.

c) Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Upon construction, the permanent increase in ambient noise levels from developed lots would not be substantial, as the noise would be identical to existing levels for residential neighborhoods. The increase in vehicle traffic on the local roadway network would also be minimal given that the 36 lots are located in clusters dispersed over the PDR and MDR areas. With the exception of Cluster 5 (on which commercial uses could be located - possibly leading to more vehicle trips), development of the remaining 11 clusters would produce a very minimal increase in traffic on the local roadway network, as discussed in Section XVI, *Transportation/Traffic*.

A change in noise levels of less than three dBA is not discernible to the general population; an increase in average noise levels of three dBA is considered barely perceptible, while an increase of five dBA is considered readily perceptible to most people (Caltrans, 1998). Therefore, for evaluation of operational noise due to project-related traffic, a noise increment of 3 dBA is used as the significance threshold for this project. A doubling of traffic volumes (100 percent increase in traffic volume) would result in a 3 dBA increase in traffic noise. Since the increase in traffic would be minimal and well below a 100 percent increase, the associated impact would also be less than significant.

The patterns of usage of the local roadway system would not change either from construction or post-construction of the 36 parcels. The traffic volumes associated with these developments would be minimal (see Section XVI, *Transportation/Tra*ffic) as not to result in congestion or changes in behavior of the local patrons of the area, and would result in a less than significant increase in noise on the local street system.

d) Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

As discussed under checklist item a), a temporary and intermittent increase in ambient noise would be experienced in the project area during actual construction on the lots. The adjacent residential dwellings are considered sensitive receptors to the lots, and most dwellings are approximately 15 to 20 feet from the property boundary. This impact to ambient noise levels in the project vicinity would be potentially significant. Therefore, this will be discussed in greater detail in the EIR.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The project area is 0.75 miles northwest from the northernmost runway of Los Angeles International Airport. The southernmost areas of PDR along Manchester Avenue are very close to the 65 dB Community Noise Equivalent Level (CNEL) contour for the airport. The MDR lots are located 2 miles to the northwest of the northernmost runway at Los

Angeles International Airport. Development would expose people residing or working in the lots to noticeable noise levels. This would be a potentially significant impact that will be discussed in greater detail in the EIR.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

The project area is about three miles south of Santa Monica airport and does not experience excessive noise levels from overflights associated with this airport. Therefore, this impact would be less than significant.

XIII. POPULATION AND HOUSING

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XIII.	**POPULATION AND HOUSING— Would the project:**				
a)	Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b)	Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c)	Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

SUMMARY

The proposed project would have a less than significant impact on growth induction and would have no impact on housing. Therefore, population and housing will not be considered further in the EIR.

POPULATION

The PDR and MDR lots are located within Los Angeles County. The estimated population of Los Angeles County for 2000 was 9,519,338 (United States Census Bureau, 2000). PDR is a community within the City of Los Angeles West Planning area with an estimated 2000 population of 464,000. The Census 2000 population count for the PDR community was 3,450

(United States Census Bureau, 2000). The estimated population for the community of MDR was 8,176 (United States Census Bureau, 2000).

According to the Regional Housing Needs Assessment (RHNA), population growth for the City of Los Angeles in the 1998-2005 period is forecast to be slower than was forecast for the 1989–1994 period. The forecast for the earlier period followed a period of very rapid growth in the 1980s, while the forecast for the 1998–2005 period follows a period of much slower growth. The forecast growth by subregion and Community Plan Area (CPA) from 1990-2010 is 6,160 people and 14,300 people for Venice and Westchester-Playa del Rey respectively (City of Los Angeles, 2000). The population capacity is 61,683 people for the Venice CPA, and 113,340 people for the Westchester-Playa del Rey CPA.

HOUSING

The existing housing stock in Los Angeles County as of 2000 was 3,272,169 with a vacancy rate of 5.5%. There are 3.1 persons per household in Los Angeles County, with 2.37 persons per household estimated in 1998 for the Westchester-Playa del Rey area (Chambers, 2000). According to the 2000 Census, MDR has a total of 6,321 housing units, a 0.7% homeowner vacancy rate, and an average household size of 1.54 persons (United States Census Bureau, 2000). The PDR census tract recorded a total of 1,574 housing units, a 1.3% homeowner vacancy rate, and an average household size of 2.26 persons (United States Census Bureau, 2000).

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

a) Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The physical potential exists for 30 new single-family homes to be constructed on the lots zoned for low density residential (R1-1) at PDR. Three lots in PDR are zoned R3-1, medium density residential use, which allows 24 to 40 dwelling units per gross acre. One lot in the PDR area is zoned for commercial use (CR-1), but could accommodate a single or two family dwelling or apartment house within an enclosed building. The two medium density residential zoned lots located in MDR are zoned multi-family residential in an established area for apartments.

The total number of dwelling units that could potentially be created is projected as follows:

PDR – R1-1	30 single-family units
PDR – R3-1	30 units
PDR – CR-1	10 units
MDR – R3-1	10 units
TOTAL	**80 units**

Using average household size numbers from the 2000 census, the projected maximum population increase would be 159 for PDR and 16 for MDR. Therefore, a total of 175 persons for all development at maximum build-out for both communities would result from development of the lots.

According to RHNA, the total housing need for the City of Los Angeles for the 1998−2005 period is less than half that calculated for the 1989-1994 period.[8] The total construction need for 2000-2005 for the unincorporated areas of the Westside sub-region is 2,933 dwelling units (SCAG, 2000). The forecast growth by subregion and CPA from 1990−2010 is 2,790 and 5,875 for Venice and Westchester-Playa del Rey respectively (City of Los Angeles, 2000). The most conservative estimate of new dwelling units construction would add less than 1% of the forecasted growth to the Venice CPA and less than 1.5% to the Westchester-Playa CPA.

The forecasted growth as a result of the project is not substantial for the area, and will not result in new businesses or indirect impacts (such as extension of roads or other infrastructure). The impact is less than significant.

b) Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

The characteristic of the project is development of new homes, respectively. The proposed development includes a total number of 80 dwelling units (see item a) above). This development is consistent with the City and County of Los Angeles General Plans land use designations, and will not result in displacement of existing housing development. There is no impact as a result of this project.

c) Would the project displace substantial numbers of people necessitating the construction of replacement housing elsewhere?

Using average household size numbers from the 2000 census, the projected maximum population increase would be 159 for PDR and 16 for MDR. Therefore, a total of 175 persons for all development at maximum build-out for both communities would result from development of the lots. The total of 80 dwelling units and 175 new persons in MDR and PDR would not be considered an adverse impact for the area. The lots in PDR and MDR are located in an already developed area. Any development of the lots would constitute infill development. Any growth that would result from further development of the proposed lots has been accounted for in the City of Los Angeles and the County of Los Angeles General Plans. Therefore, the population and housing from development of the lots is anticipated to conform to applicable General Plan land use and zoning designations and standards. Development of the lots would not induce substantial population growth in the area, nor would it displace existing housing or populations

[8] 60,280 dwelling units for the 1998 – 2005 period and 129,000 dwelling units for the 1998-2005 period.

necessitating the construction of replacement housing elsewhere. There is no impact as a result of this project.

XIV. PUBLIC SERVICES

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XIV. PUBLIC SERVICES—Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
i) Fire protection?	☐	☐	☒	☐
ii) Police protection?	☐	☐	☒	☐
iii) Schools?	☐	☐	☒	☐
iv) Parks?	☐	☐	☒	☐
v) Other public facilities?	☐	☐	☒	☐

SUMMARY

This review suggests that no significant impacts to public services would occur from the proposed project. Therefore, there will be no additional evaluation in the EIR. Parks and recreation are discussed in Section XV-Recreation.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for:

i) Fire protection. The Los Angeles City Fire Department offers fire prevention and suppression, as well as life safety protective services to the PDR area. As part of the

City's General Plan, the Fire Protection and Prevention Plan outlines policies with regard to the operation, upkeep, and development of fire protection services to city departments, government agencies, developers, and the public. If future owners of the surface rights develop the lots, all development would be required to be in accordance with local policy. The City of Los Angeles Fire Department and the City of Los Angeles Planning Department routinely review applications for development for compliance with all applicable codes, including the Fire Protection and Prevention Plan.

The nearest fire station to the PDR lots is Los Angeles City Fire Station Number 5, located at 6621 West Manchester Avenue. This station is located approximately 2 miles from the PDR community. Fire Station Number 5 has an emergency call response time of approximately 4 to 6 minutes (Elder, 2003). The nearest fire station to the MDR lots is County Fire Station Number 110, located approximately 2 miles from the MDR lots on Admiralty Way. County Fire Station Number 110 also has an average emergency call response time of approximately 4 to 6 minutes (Schafer, 2003).

A determination of impacts from the development of the lots would be made at the time individual applications for the development are processed with the City of Los Angeles. Even so, the development is not expected to have a significant impact on fire protection services in the project area.

ii) **Police protection.** The Los Angeles Police Department (LAPD) Pacific Community Division provides police protection services in the PDR project area. The MDR project area is serviced by the Los Angeles County Sheriff's Department (LASD) office in MDR.

The Pacific Community area is 24.1 square miles in size, has over 200,000 residents, and is under the jurisdiction of Operations West Bureau (LAPD, 2003). The Pacific Area Station is located at 12312 Culver Boulevard at Centinela Avenue, approximately two miles north of the PDR lots. The Sheriff's office in MDR is located on 13851 Fiji Way, approximately four miles driving distance from the MDR lots.

If the lots are developed in the future by the owner of the surface rights, all development would be in accordance with local policy and subject to review by the City and County of Los Angeles. A projected population increase of approximately 175 persons is expected from the project. This increase in population is not expected to significantly affect the adequacy of protection, response time, or other performance criteria currently provided by LAPD and LASD.

iii) **Schools.** Several schools are located within one mile of the proposed project area, including Westchester High School, Saint Bernards High School, Paseo del Rey Elementary School, Loyola Marymount University, and Loyola Village Elementary

School. Students from the project area also attend Wright Junior High School; however, it is located approximately 1.5 miles from the nearest lot proposed for sale by SCG. Saint Bernards High School is a private school. Public schools in the project area are within the Los Angeles Unified School District (LAUSD).

The capacity of public schools to accommodate increased student populations is determined based upon comparisons of the current and projected enrollment and the capacity of the school facility.

Any future development by the new owners would be in accordance with local policy and subject to review by the City and County of Los Angeles prior to accommodation by the Los Angeles Unified School District. The number of school-age children generated by the expected increase in area population LAUSD student generation rates will be projected in the EIR.

The capacity of public schools to accommodate increased student populations is determined based upon comparisons of the current and projected enrollments with the designed capacity of existing available school facilities. Since the lots are zoned for residential use and the surrounding area is highly developed, it is reasonable to assume that development of these parcels has been accounted for in population projections affecting current and future staffing and resource decisions in the school district.

Per the Leroy F. Green School Facilities Act (Senate Bill 50), the capacity of any public school cannot be considered the reason for denying a land use application. Impacts fees would be collected per Senate Bill 50 requirements at the time of building permits and would be used by the impacted schools. Payment of the impact fee would provide the legal mitigation measure for impacts to local school districts.

iv) **Parks.** The capacity of public parklands to accommodate population growth is determined by comparing current and projected acreages available or designated for public parks with the existing population of the surrounding metropolitan area. Targeted area goals for public parks have not been met for the City and County of Los Angeles. Please see Section XV, *Recreation*, for additional information.

v) **Other public facilities.** If future owners of the surface rights develop the lots, all development would be required to be in accordance with local policy and subject to review by the City and County of Los Angeles. Because of its infill nature, development of the 36 lots would not be likely to significantly impact the provision of other public facilities.

XV. RECREATION

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XV.	**RECREATION—**				
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☒	☐

SUMMARY

This review suggests that no potentially significant impact on recreation would occur from the proposed project. Therefore, no additional evaluation of recreation will be included in the EIR.

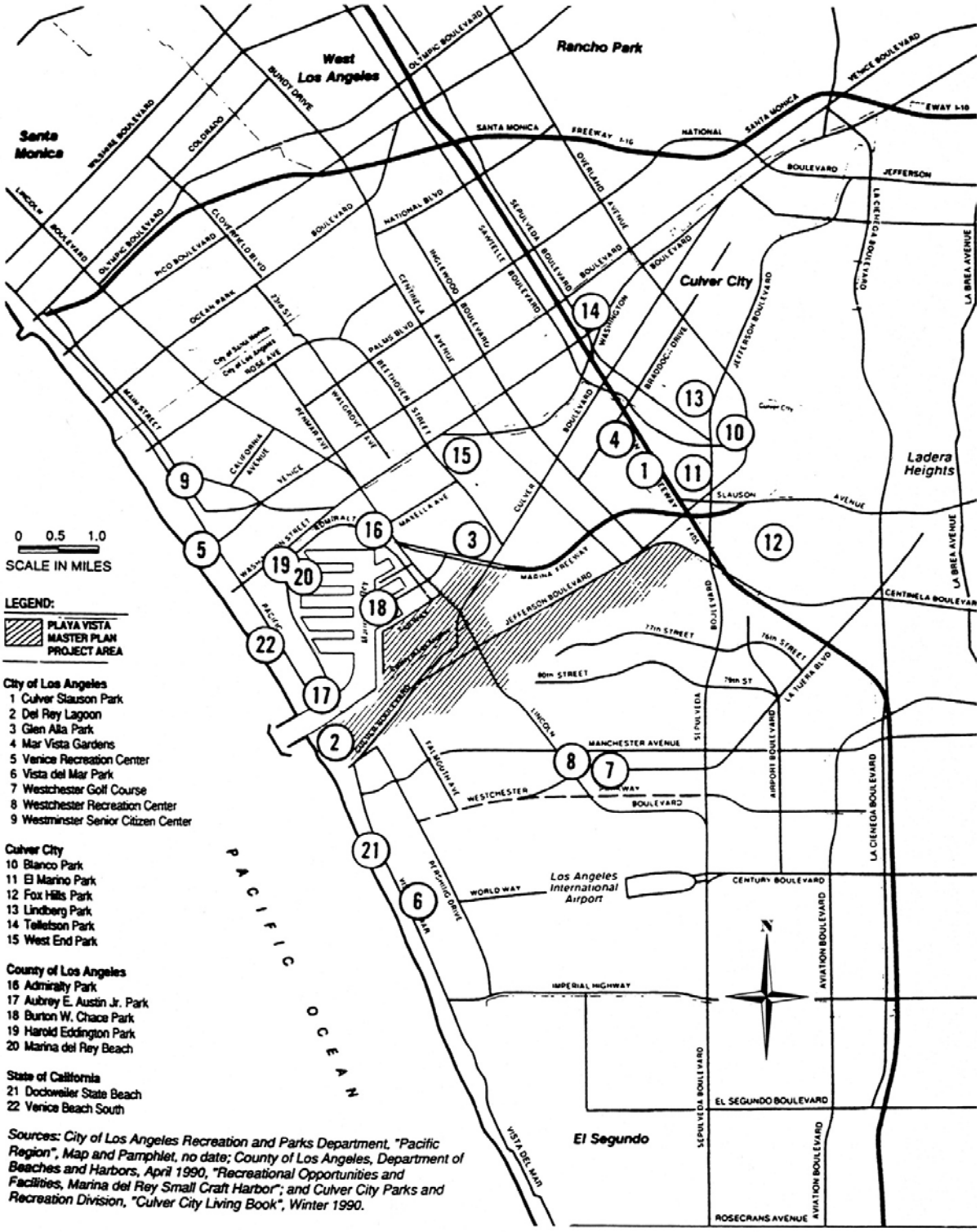
IMPACTS ANALYIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The City of Los Angeles is served by a wide variety of regional and local parks and recreation areas (Chambers, 2000). Residents also have access to state and county parks and recreational facilities. Provision of park and recreational space within the City of Los Angeles is estimated to be approximately 1.7 acres per 1,000 people. Los Angeles County provides approximately 1.6 acres of park and recreational space per 1,000 people. The Public Recreation Plan, a component of the Service Systems Element of the City of Los Angeles General Plan provides standards for the development of recreational facilities throughout the City. Long-range planning goals include the provision of four acres of parkland per 1,000 people. Short- and intermediate-range planning goals include the provision of a minimum of two acres of parkland per 1,000 people (Chambers, 2000).

There are nine city parks located within an approximately 2-mile radius of the project area (Chambers, 2000) (see Figure XV-1). Parks and Recreation facilities operated by the City of Los Angeles include the Del Rey Lagoon, Westchester Recreation Center, and Westchester Golf Course. The City's Department of Parks and Recreation maintains



SOURCE: Environmental Science Associates

Figure XV-1

City Parks in the Proximity of the Project Area

approximately 15,600 acres of parkland. Dockweiler State Beach, operated by the State Parks and Recreation Department, is located approximately one mile southwest of the proposed project, and the planned Kenneth Hahn State Recreation Area (KHSRA) is also near the proposed project. The MDR small craft harbor, operated by the Los Angeles County Department of Beaches and Harbors, provides a number of boating and water-related recreational opportunities.

None of the MDR or PDR lots have been historically used by the public for access to other property or for other public uses such as parks. The lots proposed for sale are undeveloped and many are currently landscaped and maintained by SCG. From time to time, individuals may have intentionally trespassed upon the property; however, SCG visits these properties regularly, and there is no evidence of open and notorious use over time that could result in the public believing the properties are available for public use. The lots are private property and any use by local residents is unauthorized.

If the owner of the surface rights develops the lots in the future, all development would be required to be in accordance with local policy and subject to review by the City and County of Los Angeles. Based on population and housing information (see Section XIII, *Population and Housing*), and assuming that single-family homes were developed on the available 30 single-family residential-zoned lots and multi-family homes were developed on 6 lots, a maximum population increase of approximately 175 persons would be expected. Because the City does not currently meet its standard for parkland (two acres per 1,000 residents), the addition of these residents would incrementally add to the existing parkland deficiency. Future developers would be required to either provide adequate parkland or pay an equivalent fee that would allow the City and County of Los Angeles to buy land for parks. Even so, the impacts to existing neighborhood and regional parks or other recreational facilities is less than significant as none of the properties are currently designated for recreational use and substantial physical deterioration of park or recreational facilities is not expected to occur.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

If the sites were developed, the development would have a less than significant impact on recreation and the environment. The City and County of Los Angeles would determine any impacts to the park system during their review of any proposed development on the sites. A determination of impacts from the development of the sites would be made at the time individual applications for development are processed with the City. These conditions imposed on the future developer would be required and would not be considered mitigation.

XVI. TRANSPORTATION / TRAFFIC

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XVI.	**TRANSPORTATION/TRAFFIC— Would the project:**				
a)	Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	☐	☒	☐	☐
b)	Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☒	☐	☐
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	☐	☐	☒	☐
d)	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e)	Result in inadequate emergency access?	☐	☐	☒	☐
f)	Result in inadequate parking capacity?	☐	☒	☐	☐
g)	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☒	☐

SUMMARY

The proposed project presents two potentially significant but mitigated traffic and transportation impacts. These impacts will be analyzed and considered in the EIR.

Regional freeways in the project vicinity include the Santa Monica (I-10), San Diego (I-405), Anderson (I-105), and Marina (State Route 90) Freeways. Interstate 10 provides an east-west link to downtown Los Angeles. Interstate 405 is the major north-south link in west Los Angeles. Interstate 105 connects with Imperial Highway on the south side of Los Angeles International Airport (LAX). State Route (SR) 90 provides an east-west link from I-405 to MDR.

Several arterials and local streets serve the PDR lots. The arterials include Manchester Avenue (SR 42), Lincoln Boulevard (SR 1), Culver and Jefferson Boulevards (to the north), and Pershing Drive. Manchester Avenue is an east-west road that provides the primary connection from the PDR project lots (on local residential streets) to the overall roadway network (eastward to Lincoln Boulevard and I-405, and westward to Pershing Drive). Lincoln Boulevard is a north-south roadway in the project area that connects with Sepulveda Boulevard at LAX to the south and

extends north into MDR, Venice, and Santa Monica. Culver and Jefferson Boulevards are oriented diagonally east-west roadways north of the PDR project lots and connect PDR and coastal areas farther west with Culver City and the I-405 Freeway. Pershing Drive is a north-south road that connects Manchester Avenue with Culver Boulevard to the north and Westchester Parkway to the south.

As described above, the clusters of lots within the PDR project area are served by a series of local roadways whose primary connection to the roadway network in Manchester Avenue. The local streets include Falmouth Avenue, Calabara Avenue, 79th through 83rd Streets, Saran Drive, and Gulana Avenue.

The MDR Peninsula/Venice area is served by a number of arterial and local streets. The arterials include Pacific Avenue, Washington Street/Boulevard (to the north), and Lincoln Boulevard (to the east). Pacific Avenue is a north-south street that extends from the Marina Peninsula to Venice and Santa Monica. Washington Street/Boulevard is an east-west street that begins at Pacific Avenue, and runs east to Culver City and beyond. Lincoln Boulevard (SR 1) is a north-south street in the project area that connects with Sepulveda Boulevard at LAX to the south and extends north into Santa Monica. The two lots in the Marina del Rey project area are located north of Union Jack Street, between Speedway Avenue and the Venice Beach on the MDR Peninsula.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

a) Would the project cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?

Previous traffic studies conducted in the project area have evaluated traffic levels at major intersections. The most recent studies indicated that, with one exception, a.m. (morning) and p.m. (evening) peak-hour intersection service levels are generally level of service (LOS) D or better (volume/capacity ratio of 0.88 or lower). The exception is the intersection of Manchester Avenue / Lincoln Boulevard, which was found to operate at LOS E (volume/capacity ratio of 0.91) during the p.m. peak hour.

It is assumed that the lots with residential zoning controls would be developed as single-family or multi-family housing, as appropriate to those zoning controls. For these lots, the estimated traffic generation is 334 trips per day (ITE 1997). The future use on the one project lot (in the PDR area) that is zoned commercial has not been established. With the assumption that the commercial use would be a general office building (trip generation per 1,000 square feet gross area), estimated traffic generation is 31 trips per day (ITE 1997). The estimated total traffic generation from development of the PDR and MDR lots is 365 trips per day. Construction on the project lots would also generate increased traffic on area roadways.

However, those increases would be temporary and dispersed over the network of roadways serving the project area.

According to the Coastal Transportation Corridor Specific Plan, residential dwellings are exempt from its provisions. The Plan applies only to Commercial, Manufacturing, and Automobile Parking zones. Thus, 35 of the 36 lots located in PDR and MDR would be exempt due to their residential zoning and the nature of the presumed development (i.e., residential dwellings). Additionally, the total number of trips generated by PDR and MDR development is minimal and no significant impact is anticipated as a result of this project.

The unknown use of the commercially zoned lot in PDR, even with the potentially small number of trips that may be generated could still represent a significant impact. However, this would be considered less than significant once appropriate mitigation is implemented. This impact and potential mitigation will be considered further in the EIR.

b) Would the project exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

Future owners of the surface rights would be required to develop the lots. All development would be in accordance with the local policy and subject to review by the City and County of Los Angeles. The 36 undeveloped lots will be sold to several different entities or individual owners, and are not likely to be developed all at once. However, for analysis purposes it is assumed that all of the lots would be developed at the same time, or at least within a short period of time.

The first major roadway that the local residential streets in the PDR project area meet is Manchester Avenue, and therefore it is the most likely road that area residents use to get in and out of the area. Manchester Avenue is designated as a Major Highway-Class II and has an average capacity of 36,000 vehicles per day. The City of Los Angeles assesses changes in roadway levels of service on the basis of the percent increase in traffic volumes, with different (increasingly lower) thresholds of percent increase depending on the prevailing (pre-project) level of service. For example, the impact threshold for roadways operating at LOS C is a project-generated four percent increase in roadway traffic volume; at LOS D is a two percent increase; and at LOS E is a one percent increase. Preliminary assessment of the trip generating potential associated with the project lots indicates a significant impact potentially could occur if the one commercially zoned lot was developed with a traffic-intensive use. However, this would be considered less than significant once appropriate mitigation is implemented. This impact and potential mitigation will be considered further in the EIR.

c) Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Development of the project lots would not change air traffic patterns, increase air traffic levels or result in a change in location that results in substantial safety risks. Although the project site is located in proximity of the Los Angeles International (LAX) Airport, the maximum heights of the buildings on the project lots are expected to be consistent with heights of other nearby buildings. The project effect would be considered less than significant.

d) Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The project lots are located in established neighborhoods, and development of those lots would not introduce hazardous design features or incompatible uses. There would be no sharp curves, dangerous intersections, or incompatible traffic circulation uses introduced as a result of this project. The project effect would be considered less than significant.

e) Would the project result in inadequate emergency access?

The project lots are located in established neighborhoods, and development of those lots would not result in inadequate emergency access. There would be no blockage of access or traffic pattern disturbance that could adversely impact emergency access. The project effect would be considered less than significant.

f) Would the project result in inadequate parking capacity?

Currently, the residential development surrounding the MDR and PDR lots contain designated parking areas. If the residential lots proposed for development are developed in the same manner, parking demand associated with the new houses should not generate a increase in demand to the onsite parking supply. A significant impact potentially could occur if the one commercially-zoned lot were developed without sufficient onsite parking supply. Without knowing the intended development scenario of the commercial lot, a demand can not be estimated. The peak parking demand that would be generated by the commercial lots can be estimated in the EIR analysis if the intended use is known. An impact determination can be made at that time.

g) Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

The project lots are located in established neighborhoods, and development of those lots would not conflict with adopted policies, plans, or programs supporting alternative transportation. There would be no bus stops, turnouts, substantial increase in public transportation, substantial increase in bicycle racks, etc. as a result of this project. The project effect would be considered less than significant.

XVII. UTILITIES AND SERVICE SYSTEMS

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XVII.	**UTILITIES AND SERVICE SYSTEMS— Would the project:**				
a)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐
b)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
c)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
e)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g)	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

SUMMARY

Development of the proposed project would not be expected to impact utilities and service systems. However, impacts to utilities and service systems will be addressed in the EIR in order to verify that the lots would be sufficiently served by utility providers and facilities.

IMPACTS ANALYSIS

SALE AND DEVELOPMENT OF THE PLAYA DEL REY AND MARINA DEL REY LOTS

Development of all 36 lots in PDR and MDR is calculated to increase the local population by less than 1%. Development of the lots under consideration would be subject to all policies of the City and County of Los Angeles, and a determination of impacts would be made as individual applications are submitted. Due to the infill nature of development of these lots, and the existing availability of services to the area, adverse impacts to utilities would not be expected.

a) Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Development of the lots is not expected to exceed wastewater treatment requirements of the local Regional Water Quality Control Board. However, potential impacts to wastewater treatment requirements will be further analyzed in the EIR.

b) Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Water

The Los Angeles Department of Water and Power (LADWP) provides potable water for the City of Los Angeles, including the project area. Water service is currently available to the lots to be sold in PDR and MDR. According to the LADWP's Urban Water Management Plan (UWMP) 2001 – 2002 Annual Update, the LADWP supplied approximately 680,000 acre-feet (AF) of water to its customers during fiscal year 2002 (July 1, 2001 through June 30, 2002). LADWP currently receives its water supply from the Los Angeles Aqueducts (228,396 AF for fiscal year 2002), local groundwater (73,387 AF for fiscal year 2002), and from the Metropolitan Water District of Southern California (MWDSC) (372,357 AF for fiscal year 2002). These supplies were adequate to meet the City's water demand during fiscal year 2002.

In addition to water supply, the UWMP discusses water demand management. LADWP operates a water conservation program that results in a demand reduction of approximately 15%. In addition, recycled water is currently used in the City to meet irrigation, commercial, and industrial demands, where feasible. LADWP also submitted a proposal to MWDSC in June 2002 for construction of seawater desalination facility. LADWP has met the immediate water needs of its customers and is well-positioned to continue to do so in the future. However, LADWP will continue to rely upon its investments in MWDSC to meet future needs that exceed its own water resources (LADWP, 2002).

Adverse impacts to water supply or delivery are not expected from development of the lots. According to the Department of Water and Power (DWP) for the City of Los Angeles, the lots proposed for sale could be supplied with water from the municipal system subject to the Water System Rules of the DWP. In addition, the UWMP 2002 Annual Update indicates that the LAPWD is well-positioned to continue to meet the immediate demands of its customers (LADWP, 2002).

Wastewater

The City of Los Angeles Department of Public Works, Bureau of Sanitation provides sewer service to all areas within the City boundary. The Bureau provides planning and financial management, and maintains and operates the wastewater collection and treatment system. The Bureau of Engineering provides design and construction engineering. The wastewater

system in the PDR and Marina de Rey area includes a wastewater collection system, the Hyperion Wastewater Treatment Plant, and the discharge of treated effluent to Santa Monica Bay. The wastewater collection system serving Los Angeles consists of about 6,000 miles of pipe, and about 150 miles of outfall sewers and major interceptors. The interceptor sewer line in the project area is in the North Outfall Sewer (NOS), and is one of the four major interceptor sewers used to convey wastewater to the Hyperion Treatment Plant. The Plant currently receives an average flow of 360 million gallons per day (MGD), and has the capacity to accommodate up to 450 MGD. Peak wet weather flows up to 1,000 MGD can be handled for short periods (City of Los Angeles, 2001). Several collection system improvements are currently in progress to accommodate anticipated growth through the year 2010.

The Hyperion Treatment Plant currently receives an average flow of 360 MGD, and has an excess capacity of approximately 90 MGD. In addition, peak wet weather flows up to 1,000 MGD can be handled for short periods (City of Los Angeles, 2001).

The Hyperion Treatment Plant has the capacity to receive wastewater flows above the current average levels being processed. Adverse impacts to wastewater disposal are not expected from development of the lots (see Section IX, *Hydrology and Water Quality*). According to the Bureau of Sanitation, the Hyperion Treatment Plant has sufficient capacity to accommodate the development of 36 lots in the PDR area. Therefore, development would not be expected to require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities. However, confirmation from the Bureau of Sanitation that the Hyperion Treatment Plant has sufficient capacity to serve the developed lots was obtained in 2000. Therefore, the EIR will verify that this information is still current and accurate.

c) Would the project require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

The project site is located within a highly developed area, with developed stormwater drainage facilities in place. Development would not require or result in the construction of new community stormwater drainage facilities or expansion of existing community facilities. For more information, see Section IX, *Hydrology and Water Quality*.

d) Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Adverse impacts to water supply or delivery are not expected from development of the lots. According to LADWP, the lots proposed for sale could be supplied with water from the municipal system subject to the Water System Rules of the DWP. In addition, the UWMP 2002 Annual Update indicates that the LADWP is well-positioned to continue to meet the immediate demands of its customers (LADWP, 2002).

However, confirmation from LADWP that it has sufficient capacity to serve the developed lots was obtained in 2000. Therefore, the EIR will verify that this information is still current and accurate.

e) Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

See item b), above.

f) Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

The Los Angeles County Sanitation Bureau (LACSB) disposes of the refuse it collects into three landfills, two operated by private entities and one by the Los Angeles County Sanitation Districts: the Bradley Landfill, owned and operated by Waste Management, Inc.; the Sunshine Canyon Landfill, owned and operated by Browning Ferris Industries; and the Calabasas Landfill operated by the LACSB. According to the California Integrated Waste Management Board's (CIWMB) waste stream profiles, these landfills are not expected to reach capacity until 2020 (CIWMB, 2003). In addition, the LACSB contracts with several Material Recovery Facilities owned and operated by the private sector, to receive, clean, process, and market recyclables. The LACSB also has three city operations and several contracts with private contractors to accept, clean, grind, and mulch or compost yard trimmings.

Development would be expected to be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs. However, potential impacts to the three landfills that currently serve the City will be considered further in the EIR.

g) Would the project comply with federal, state, and local statutes and regulations related to solid waste?

Solid waste collection and disposal in the City of Los Angeles is carried out by both public and private refuse collection services and solid waste disposal facilities. The City has developed a strong waste management infrastructure including a myriad of reduction, recycling, composting, and reuse programs. The City has surpassed the state mandated 50% diversion rate, and for the year 2000 has achieved a 58.8% diversion rate (Bureau of Sanitation, 2001).

If the purchasers of the lots choose to develop them, all local policies and regulations governing solid waste disposal would apply. Development would be expected to comply with federal, state, and local statutes and regulations related to solid waste.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
MANDATORY FINDINGS OF SIGNIFICANCE— Does the project:				
a) have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) have impacts that are individually limited, but cumulative considerable? ("Cumulative considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

IMPACTS ANALYSIS

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

In general, the proposed project (both the sale of the lots and potential future development) will not degrade the quality of the environment, reduce fish or wildlife habitat, cause a drop in fish or wildlife population, threaten to eliminate a plant or animal community, reduce the range of rare or endangered plant or animal or eliminate any important examples of California history or prehistory. The only exception to this are the potential impacts described in Section IV, *Biological Resources*. Two Clusters, 9 and 12 contain potential habitat that, if the lots were developed could cause a reduction in habitat for special animals. This is considered potentially significant and will be studied further in the EIR.

b) Does the project have impacts that are individually limited, but cumulative considerable? ("Cumulative considerable" means that the incremental effects of a

project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

The proposed project, in addition to past and future developments on the PDR and MDR area, and in the surrounding planned urban developments, would result in additional infilling for PDR and MDR. The CPUC approval of the SCG application would most likely lead to the connected actions of urban land development on all sites. The likely primary cumulative considerable effects are that of construction related runoff into the Ballona wetlands from potential construction on sites in PDR and the cumulative impact to local traffic. These are considered potentially significant and will be examined in greater detail in the EIR.

c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

The primary concern for adverse effects on human beings focuses on the potential risk of future releases of gas from abandoned wells located on each project cluster. These risks, although small, have the potential to pose either toxic or safety hazards to future occupants of these properties and until additional sampling and a risk assessment have been prepared to better asses these potential risks, the project represents potentially significant impacts which will be further evaluated in an EIR.

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APPENDIX A

BACKGROUND INFORMATION FOR ABANDONED WELLS AND CLUSTERS

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BACKGROUND INFORMATION FOR ABANDONED WELLS AND CLUSTERS

Southern California Gas (SCG) maintained ownership of lots in Playa del Rey and Marina del Rey associated with wells utilized as oil production wells and those converted for gas storage operations. In order to operate and maintain such wells, sufficient land around each well was required to support the transport and operation of heavy equipment used in well servicing. There are 12 abandoned SCG wells located on the proposed project lots (see Table 1). Each cluster (two to four lots per cluster) of lots contains one well. Cluster 1 contains only a single well located on a single lot. Cluster 8 has two wells, each associated with either the 4 north lots or the 4 south lots.

DESCRIPTION OF ABANDONED WELLS

Joyce, Samarkand, 23-1, 29-1, and 29-2

These wells were part of the fluid system that removed underground saltwater that would otherwise fill the porous rock in the Storage Zone. The wells were abandoned because they did not produce significant amounts of water, and the cost to operate them exceeded the benefit.

Anglo, American Champ No. 1, and O&M 1

These wells were drilled in 1935 and abandoned in 1937 and 1936 respectively, because they were not producing oil in economically viable amounts. SCG did not operate these wells. However, SCG re-abandoned these wells in 1958 to bring their abandonment quality up to existing California Division of Oil, Gas and Geothermal Resources (DOGGR) standards. These wells were never involved in storage operations.

Hisey 1, Lormar 1, Merrill, and 13-1

These wells were located in a smaller, separate reservoir (in the same formation as the main area) that was not providing useable storage capacity. This reservoir became saturated with water in the 1970s and has not been used since then.

Troxel (MDR)

This observation well was located in a different reservoir and thus was not providing any value in the storage field.

DESCRIPTION OF CLUSTERS/LOTS

Cluster 1 - Lot 6 on the Corner of 81st Street and Berger Place (Figure I-1)

This lot is located at the northeast corner of 81st Street and Berger Place. Single-family homes border the project site on the north and east, and are located across 81st Street and Berger Place. The site is level, covered with grass, and has a brick divider wall of approximately four feet on two sides.

Cluster 2 - Lots 3, 4 on 82nd Street (Figure I-2)

This group of adjoining lots is located along the north side of 82nd Street. The lots are surrounded by single-family homes and are unfenced. The site is mostly level and contains vegetation, including trees and grass.

Cluster 3 - Lots 14-16 on 83rd Street (Figure I-3)

This group of adjoining lots is located at the corner of 83rd Street and Saran Drive. The lots are surrounded by single-family homes. There is a wooden fence with a brick base that borders one edge of the cluster. The site is level and contains vegetation, including mature trees and grass.

Cluster 4 - Lots 6, 7 on 85th Street (Figure I-4)

This group of adjoining lots is located along 85th Street and is surrounded by single-family homes. The site is mostly level, with mature vegetation, including trees, shrubs and grass. The site is unfenced.

Cluster 5 - Lot 11 on Saran Drive (Figure I-5)

This single lot is located along Saran Drive, south of Manchester Avenue. The lot is bordered on the west by Saran Drive, and on the east and north by commercial shops and offices. An apartment complex is located south of the lot, across an alley. The lot is unfenced and contains mature trees, with shrubs and grass. Dirt trails and utility poles traverse the site.

Clusters 6 and 7 - Lots 14-18 on 83rd Street (Figure I-6) and Lots 28-30 on Manchester Avenue (Figure I-7)

This group of adjoining lots is bordered on the north by 83rd Street and by Manchester Avenue. Single-family and apartment homes border the site on the east and west. The lots are unfenced and mounds of dirt are located throughout the site. The lots contain mature vegetation, including trees, shrubs, and grass. Dirt trails traverse through the site.

Cluster 8 - Lots 17-20 on 79th Street and Lots 82-85 on 83rd Street (Figure I-8)

This group of adjoining lots is bordered on the north by 79th Street and on the south by 83rd Street. The lots are bordered by residential development on the east and one home is located at the corner of Gulana Avenue and 83rd Street and is surrounded on two sides by the undeveloped lots. The lots are unfenced and contain mature vegetation, including trees, shrubs, and grass. Dirt trails traverse the site.

Cluster 9 - Lots 5, 6, 7, 8 on 83rd Street (Figure I-9)

These adjoining lots are surrounded by single-family residential development. The lots are accessed from the northern edge along 83rd Street. Adjacent to the lots on the south are several small apartment complexes. These lots are not fenced and are characterized by mature trees and a small grassy area with a bench.

Cluster 10 - Lots 5, 6, 7 on Calabara Avenue (Figure I-10)

These lots are bordered on the north and south by single-family homes. The lots are bordered on the west by Calabara Avenue and on the east by Falmouth Avenue. Steep slopes on Calabara Avenue characterize the lots approximately 25 feet higher than Falmouth Avenue. Surrounding residential homes are built into the slope, with the front entrances on Calabara Avenue and the rear yards along Falmouth Avenue. The lots are not fenced and the site contains a mix of low-growing vegetation on the slope, with some trees and shrubs along the northern and southern boundaries of the site.

Cluster 11 - Lots 18, 19 on Calabara Avenue (Figure I-11)

This group of adjoining lots is bordered on the west by Calabara Avenue and on the east by Falmouth Avenue. The lots are bordered on the north and south by single-family detached homes. Steep slopes, on Calabara Avenue, characterize the lots approximately 35 feet higher than Falmouth Avenue. The site is fenced and contains a retaining wall, which is present on a portion of the site. The site contains a mix of low-growing vegetation, with a few trees and shrubs along the northern and southern boundaries of the site.

Cluster 12 - Lots on Speedway in Marina del Rey (Figure I-12)

These two adjoining lots are located north of Union Jack Street and between Speedway Avenue and Venice Beach on the Marina del Rey (MDR) peninsula between the Santa Monica Bay and the channel of MDR. The site is bordered on the north and south by multi-family apartment buildings, on the west by Venice Beach, and on the east by alleyways, lanes, and Speedway Avenue. The lots are fenced and covered with moderately sparse grass and sand.

APPENDIX B

AIR QUALITY BACKGROUND INFORMATION

APPENDIX B

AIR QUALITY BACKGROUND INFORMATION

REGULATORY SETTING

FEDERAL

The National Ambient Air Quality Standards (NAAQS) have been established for carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM_{10}), and lead (Pb) (see Table B-1). These contaminants are referred to as criteria pollutants. Areas are classified under the federal Clean Air Act (CAA) as either "attainment" or "non-attainment" areas for each criteria pollutant based on whether the NAAQS have been achieved or not. The SCAB is designated as a non-attainment area for O_3, CO, and PM_{10}. The South Coast Air Basin (SCAB) is designated as an attainment area for SO_2 and lead, and a maintenance area for NO_2.

In addition to criteria pollutants, the Environmental Protection Agency (EPA) is concerned with Hazardous Air Pollutants (HAPs), which are substances with the potential to cause or contribute to an increase in mortality or an increase in serious illness, or may pose a present or potential hazard to human health. Title III of the 1990 Federal Clean Air Act Amendment (FCAAA) identified 189 HAPs. Control of toxic air emissions is implemented under Section 112 (HAPs) of the FCAAA. Implementation of the NAAQS to control criteria pollutants has also resulted in the reduction of toxic air contaminants.

STATE STANDARDS

In 1967, California's legislature passed the Mulford-Carrel Act, which established the California Air Resources Board (CARB). The CARB sets state air quality standards for criteria pollutants. The state standards for these pollutants are more stringent than the corresponding federal standards. As in the federal CAA, the California CAA classifies areas as either being in attainment or non-attainment for these criteria pollutants. Areas designated as non-attainment are then given a time frame to achieve attainment.

To control HAPs and Toxic Air Contaminants (TAC), the California legislature has adopted several state bills. A more thorough description of HAP and TAC regulations can be found in the Hazards Section of this document.

LOCAL REGULATIONS

The PDR and MDR lots are is located within the jurisdiction of the South Coast Air Quality Management District (SCAQMD), which adopted an Air Quality Management Plan (AQMP) in 1979, which has been revised and amended several times. Currently, the SCAQMD is operating under the 1997 AQMP and the

TABLE B-1
AMBIENT AIR QUALITY STANDARDS FOR CRITICAL POLLUTANTS

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone (O_3)	1 hour	0.09 ppm	0.12 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Motor vehicles.
	8 hours	---	0.08 ppm		
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Classified as a chemical asphyxiant, CO interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9 ppm	9.0 ppm		
Nitrogen Dioxide (NO_2)	Annual Average	---	0.05 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.25 ppm	---		
	1 hour	0.25 ppm	---		
	24 hours	0.04 ppm	0.14 ppm		
Suspended Particulate Matter (PM-10 , PM-2.5)	Annual Geometric Mean	30 ug/m^3 (PM_{10})	65 ug/m^3 ($PM_{2.5}$)	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).
	Annual Arithmetic Mean	---	50 ug/m^3 (PM_{10})		
	24 hours	50 ug/m^3 (PM_{10})	150 ug/m^3 (PM_{10}) 15 ug/m^3 ($PM_{2.5}$)		
Lead	Monthly	1.5 ug/m^3	---	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurologic dysfunction (in severe cases).	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	---	1.5 ug/m^3		

SOURCE: California Air Resources Board, *Ambient Air Quality Standards*, January 25, 1999.

1999 amendment to the 1997 ozone portion of the AQMP. The SCAQMD is in the process of preparing the proposed 2003 Air Quality Management Plan (AQMP) for the South Coast Air Basin. The 2003 AQMP seeks to demonstrate attainment with state and federal air quality standards and will incorporate a revised emissions inventory, the latest modeling techniques, and updated control measures remaining from the 1997/1999 State Implementation Plan and new control measures based on current technology assessments.

The SCAQMD regulates air pollutants in the SCAB through the promulgation of rules and regulations and through the issuance of permits to operate to local industry. Permits establish conditions on specific pieces of equipment and on industrial processes. Currently, the nearby SCG Playa del Rey Gas Storage Facility (PDRGSF) has ten permitted pieces of equipment and is operating under 35 different SCAQMD regulations. None of the permitted or regulated sources are located on or adjacent to the lots included in the scope of this Initial Study.

ANTICIPATED EFFECTS ON PROJECT OPERATION

Originally, the wells and associated lots described in this document were used or could have been used for monitoring of gases and liquids in the storage zones (6000 ft below ground surface) and may be developed for later use if needed for the gas storage system. At present, the lots provide no useful or commercially viable contribution to the operations and maintenance of the PDRGSF. SCG's remaining wells and facilities are adequate for continued operations of the gas storage facility following the proposed sale of the 36 lots.

CRITERIA POLLUTANTS

OZONE (O_3)

The most pervasive air quality problem in the air basin is high O_3 concentrations. Ozone is not emitted directly, but is a secondary pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic compounds (ROC) and nitrogen oxides (NO_X). Significant O_3 production generally requires about three hours in a stable atmosphere with strong sunlight. Ozone is a regional air pollutant because it is transported and diffused by wind concurrent with the photochemical reaction process. Motor vehicles are the major source of ozone precursors in the basin. During late spring, summer and early fall, light winds, low mixing heights, and abundant sunshine combine to produce conditions favorable for maximum production of O_3. Ozone causes eye and respiratory irritation, reduces resistance to lung infection, and may aggravate pulmonary conditions in persons with lung disease. Ozone is also damaging to vegetation and untreated rubber.

CARBON MONOXIDE (CO)

Carbon Monoxide is a non-reactive pollutant emitted primarily by motor vehicles. Ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic and are also influenced by meteorological factors such as wind speed and atmospheric mixing. When strong surface inversions formed on winter nights are coupled with near-calm winds, CO from automobile exhaust becomes concentrated. The highest CO levels within the Basin are almost always measured during the winter. Carbon Monoxide interferes with the transfer of oxygen to the blood. It may cause dizziness and fatigue and can impair central nervous system functions. The one-hour CO standard has not been exceeded at the closest Monitoring Station in the last five years.

NITROGEN DIOXIDE (NO_2)

There are two oxides of nitrogen which are important in air pollution: Nitric Oxide (NO) and NO_2. Nitric oxide, along with some NO_2, is emitted from motor vehicle engines, power plants, refineries, industrial boilers, ships, aircraft, and railroads. Nitrogen dioxide is primarily formed when NO reacts with atmospheric oxygen in the presence of ROC and sunlight; the other product of this reaction is ozone. Nitrogen dioxide is the whiskey brown colored gas, more commonly known as smog, readily observed during periods of heavy air pollution. Concentrations of NO_2 are highest during the late fall and winter. Nitrogen dioxide increases damage from respiratory disease and irritation, and may reduce resistance to certain infections. The state standard for NO_2 has not been exceeded in the last five years in the project area.

PARTICULATE MATTER

PM-10 and PM-2.5 consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. (A micron is one-millionth of a meter). PM-10 and PM-2.5 represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility.

The primary sources of PM-10 emissions in the project area are mainly from urban sources, dust suspended by vehicle traffic and entrained road dust, and secondary aerosols formed by reactions in the atmosphere. Traffic generates particulate matter and PM-10 emissions through entrainment of dust and dirt particles that settle onto roadways and parking lots. PM-10 is also emitted by burning wood in residential wood stoves and fireplaces. Particulate concentrations near residential sources generally are higher during the winter, when more fireplaces are in use and meteorological conditions prevent the dispersion of directly emitted contaminants. PM-10 standards have been exceeded on an average of 6.8 days per year in the project area between 1997 and 2001.

TOXIC AIR CONTAMINANTS (TACS)

Toxic Air Contaminants (TACs) are pollutants known or suspected to cause cancer or other serious health effects such as birth defects. TACs may also have significant adverse environmental and ecological effects. Examples of TACs include benzene, diesel particulate, hydrogen sulfide, methylchloride, 1,1,1-trichloroethane, toluene, and metals such as cadmium, mercury, chromium, and lead. Health effects from TACs vary depending on the specific toxic pollutant but may include cancer, immune system damage, as well as neurological, reproductive, developmental, and respiratory problems.

According to the EPA, approximately 50% of the TACs we are exposed to come from mobile source emissions. The EPA and the CARB are both concerned over diesel particulate matter emissions. The

EPA has published its final rule to control emissions of hazardous air pollutants from mobile sources, in the March 29, 2001 Federal Register. The CARB approved a comprehensive diesel risk reduction plan in September 2000. Health risks associated with TACs will be summarized in the Hazard Section of this Initial Study.

HYDROGEN SULFIDE (H_2S)

Hydrogen Sulfide is a colorless, flammable gas with a distinctive "rotten egg" odor. Anaerobic decay processes involving sulfur-bearing materials may create H2S naturally. Natural decay as an H_2S source, however, is quite limited. Most commonly, H_2S is released from petroleum resource operations when underground natural gas contains a substantial fraction of H_2S. Whereas the cap rock over underground accumulations of such gas within various Los Angeles Basin oilfields is generally impermeable, compromise of that cap layer has occurred through petroleum extraction from wells drilled through the cap. Although abandoned wells are sealed to minimize future leakage of H_2S-bearing gas, some wells may leak with passing time.

The SCAQMD has recorded 60 odor complaints since 1988 linked directly to the PDRGSF[9]. In addition, several wells in the Ballona Wetlands and Marina del Rey area have been reported as "leaking" by various citizens and agencies.

In January 2001, Giroux & Associates performed a screening level monitoring for H_2S. Utilizing passive sampling badges, 100 air samples were taken over a five-day period. Giroux & Associates analysis concludes that except near storm drains, there was minimal indication of any H_2S. The analysis further stated that it is unknown if this observed material was due to biogenic decay within a large adjacent storm drain, due to a leaking well, or due to any Southern California Gas (SCG) operations. Due to the uncertainty of this screening level monitoring, a more comprehensive H_2S monitoring program is currently being undertaken in support of analysis this proposed project. Results from this detailed monitoring will be reported in an EIR.

METHANE

Methane is a colorless, odorless, flammable gas, which is the main constituent of natural gas. In the past the migration of methane in the form of natural gas to surface areas has resulted in fires and explosions. Some studies have hypothesized that natural gas can migrate up through abandoned well heads.[10] Due to these concerns, methane migration monitoring was conducted at representative well sites located on the bluff at Playa del Rey (Lor Mar), and at the Troxel well (Cluster 12) in Marina del Rey. Giroux & Associates conducted monitoring within a cavity created by encasing the subsurface wellhead within a hollow enclosure with surface access. Methane measurements were made with a flame ionization detector for organic gases (Photovac Micro-FID) for a month after equipment installation. Troxel well (Marina del Rey) probe installation encountered pockets of crude oil mixed with sand that apparently spilled when this was an operating oil well. Nothing in the report findings suggested any clear risk of

9 South Coast Air Quality Management District Complaint Summary Report, last dated report 04/18/03.
10 Gas Migration from Oil and Gas Fields and Associated Hazards, Journal of Petroleum Science and Engineering, 9 (1993) 223-238 Department of Civil Engineering, University of Southern California, Gurevich, A.E., Endres, B.l., Robertson, J.O., and Chelingar, G.V.

home construction atop these two well sites. (Giroux & Associates, November 5, 2001) It is not known to what extent these findings can be generalized to all the lots proposed for sale. To this end, an in depth methane migration monitoring study at all twelve lot clusters is presently underway to verify the conclusions reached in the last study and assist in a risk assessment of these properties. The results of this study will be included in an EIR.

ODORS

Though offensive odors rarely cause any physical harm, they are unpleasant and can lead to public distress generating citizen complaints to local governments. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source, wind speed and direction, and the sensitivity of receptors. Odor impacts should be considered for any proposed new odor sources located near existing receptors, as well as any new sensitive receptors located near existing odor sources. Generally, increasing the distance between a receptor and the source (buffer zone) to an acceptable level will mitigate odor impacts. Additional odor monitoring is presently underway and the results will be included in an EIR.

APPENDIX C

BIOLOGY BACKGROUND INFORMATION

APPENDIX C

BIOLOGY BACKGROUND INFORMATION

REGULATORY SETTING

FEDERAL

FEDERALLY-LISTED SPECIAL STATUS SPECIES

The U.S. Fish and Wildlife Service (USFWS) is the primary federal regulatory authority for biological resources within Los Angeles County. This agency provides regulatory protection for listed animals and plants present in the Los Angeles County area that are protected species by the Federal Endangered Species Acts (FESA). Federally listed threatened and endangered species and their habitats are protected under provisions of the FESA. "Take" under FESA includes activities such as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect. Harm specifically includes significant habitat modification or degradation. The USFWS regulates activities that may result in take of individuals. Candidate species proposed for listing also receive special attention from federal agencies during their review.

WATERS OF THE U.S.

The U.S. Army Corps of Engineers (USACE) has jurisdiction over waters of the U.S. under Section 404 of the Clean Water Act and navigable waters of the United States under Section 10 of the Rivers and Harbors Act of 1899. Waters of the U.S. (jurisdictional waters) under Section 404 include all waters used, or potentially used, for interstate commerce. Such waters include wetlands, tidal waters, tributary waters, and other waters such as lakes. Wetlands are defined as habitats that have three important characteristics: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Wetlands include marshes, meadows, swamps, bogs, floodplains, basins, and seeps. Wetlands may also include less obvious areas such as seasonal ponds, seasonally wet pastures, or seasonal meadows. Navigable waters of the U.S. subject to USACE jurisdiction under Section 10 include all lands below mean high water, including former tidal areas that are behind a dike but not yet filled above mean high water. Project activities that will result in fill, dredging, destruction, or alteration of Waters of the U.S. must be in compliance with permit requirements of the USACE.

MIGRATORY BIRDS

The Federal Migratory Bird Treaty Act (FMBTA, 16 U.S.C., Sec. 703, Supp. I) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. The FMBTA encompasses whole birds, parts of birds, and bird nests and eggs. Migratory is defined broadly in the FMBTA so that most native birds fall under its provisions. The

FMBTA is typically applied on domestic projects to prevent injury or death of nesting birds and their chicks.

STATE

STATE-LISTED SPECIAL STATUS SPECIES

The California Department of Fish and Game (CDFG) is the primary state regulatory authority for biological resources within Los Angeles County. These agencies provide regulatory protection for listed animals and plants present in the Los Angeles County area that are protected species by the California and federal Endangered Species Acts (CESA and FESA). State-listed rare, threatened, and endangered species are protected under provisions of CESA. Activities that may result in take of individuals (e.g., hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill) are regulated by the CDFG. CDFG has interpreted "take" to include the destruction of nesting and foraging habitat necessary to maintain viable breeding populations of relevant state threatened or endangered species.

SPECIES OF SPECIAL CONCERN AND PROTECTED SPECIES

The CDFG has produced lists of species of special concern that serve as watch lists. Species on these lists either are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Thus, their populations should be monitored. These species may receive special attention during environmental review, and may require mitigation under the California Environmental Quality Act (CEQA) if impacts are substantial. The California Fish and Game Code also provides lists of vertebrate species that are designated "fully protected." Such species cannot be taken or possessed without a permit. Table C-1 provides information regarding potential occurrence of special status species and sensitive habitats at the lots.

TABLE C-1
POTENTIAL OCCURRENCE OF SPECIAL STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR and MDR LOTS

Common Name ***Scientific Name***	**Status** **FWS/CDFG/CNPS**	**General Habitat**	**Potential to Occur at PDR and MDR Lots**
		LISTED SPECIES	
PLANTS			
Ventura marsh milk-vetch *Astragalus pycnostachyus* var. *lanosissimus*	FE/CE/1B	Coastal salt marsh.	**Low Potential.** Only known at one site in Ventura county. Historically occurred at Ballona marshes on north side of Marina Del Rey in early 1900s.
San Fernando Valley spineflower *Chorizanthe parryi var fernandina*	FC/CE/1B	Coastal dune scrub.	**Low Potential.** Occurred near Ballona Creek at Marina Del Rey in early 1900's.
Beach spectaclepod *Dithyrea maritima*	FSC/CT/1B	Coastal sand dunes and coastal scrub.	**Low Potential.** Occurred at Ballona marshes at Marina Del Rey in early 1900s.
ANIMALS			
Mammals			
Pacific pocket mouse *Perognathus longimembris pacificus*	FE/CSC	Sandy to rocky soils in coastal sage scrub in southern coastal plains - possibly extinct.	**Low Potential.** Historically occurred at Marina Del Rey in 1938. Suitable habitat for this species does not occur within the PDR and MDR Lots.
Birds			
Western snowy plover (nesting colony) *Charadrius alexandrinus nivosus*	FT/CSC	Sandy beaches on marine and estuarine shores - requires sandy, gravely, or friable soils for nesting.	**Low Potential.** Historically nested at Playa Del Rey and Docweiler State Beach 1894 - 1914. No suitable nesting habitat at PDR and MDR Lots.
California black rail *Laterallus jamaicensis coturniculus*	FSC/CT	Coastal salt marsh.	**Low Potential.** Reportedly occurred at Playa Del Rey in 1928. No suitable nesting habitat at PDR and MDR Lots.
Belding's savannah sparrow *Passerculus andwhichensis beldingi*	FSC/CE	Nests in Southern California coastal marshes - frequents pickleweed in a few scattered saline emergent wetlands from Santa Barbara County south. Nests on the ground under vegetation.	**Low Potential.** Observed on South side of Ballona Creek west of Culver Blvd. and Jefferson Blvd. intersection in 2001. No suitable nesting habitat within PDR and MDR Lots.
Coastal California gnatcatcher (nesting) *Polioptila californica californica*	FT/CSC	Low coastal sage scrub in arid washes, on mesas and slopes.	**Low Potential.** Reported at Baldwin Hills in Culver City vicinity. No suitable nesting habitat within PDR and MDR Lots.

TABLE C-1 (Continued)
POTENTIAL OCCURRENCE OF SPECIAL STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR and MDR LOTS

Common Name ***Scientific Name***	**Status** **FWS/CDFG/CNPS**	**General Habitat**	**Potential to Occur at PDR and MDR Lots**
		LISTED SPECIES (Continued)	
Birds (cont.)			
California least tern (nesting colony) *Sterna antillarum browni*	FE/CE	Nests along the coast from San Francisco Bay south to northern Baja California - colonial breeder on bare or sparsely vegetated flat substrates including sand beaches, alkali flats, land fills, or paved areas.	**Low Potential.** Observed nesting at Marina Del Rey and Playa Del Rey in 1996 and 1987. No nesting habitat at PDR and MDR Lots.
Invertebrates			
El Segundo Blue Butterfly *Euphilotes battoides allyni*	FE/--	Coastal dunes with adult and larva hostplant *Eriogonum parvifolium.*	**Low Potential.** Populations known from three fragments of habitat, with El Segundo Dunes west of LAX Airport being the largest site. No hostplants observed at PDR and MDR Lots
		SPECIES OF SPECIAL CONCERN	
Mammals			
Pallid bat *Antrozous pallidus*	--/CSC	Roost in caves, crevices, open buildings, mines and tunnels, feeding mostly on ground insects; locally common species of low elevations in California.	**Low Potential.** No reported occurrences. Suitable habitat for this species does not occur at the project area.
Western mastiff bat *Eumops perotis*	FSC/CSC	Roosts in crevices on cliff faces, high buildings, trees and tunnels foraging on high flying insects; uncommon resident in southeastern San Joaquin Valley and Coastal Ranges from Monterey Co. southward through southern California, from the coast eastward to the Colorado Desert.	**Low Potential.** No reported occurrences. Suitable habitat for this species does not occur within the project area.
Long-eared myotis *Myotis evotis*	FSC/--	Roosts in buildings, crevices, under bark, snags, feeding on arthropods; occurs along the entire coast.	**Low Potential.** No reported occurrences. Suitable habitat for this species does not occur at the project area.
Townsend's big eared bat *Plecotus townsendii townsendii*	FSC/CSC	Roosts in caves, mines tunnels and buildings, feeding on moths; found in all but subalpine and alpine habitats, and may be found at any season throughout its range; abundant in mesic sites.	**Low Potential.** No reported occurrences. Suitable habitat for this species does not occur within the project area.

TABLE C-1 (Continued)
POTENTIAL OCCURRENCE OF SPECIAL STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR and MDR LOTS

Common Name ***Scientific Name***	**Status** **FWS/CDFG/CNPS**	**General Habitat**	**Potential to Occur at PDR and MDR Lots**
		SPECIES OF SPECIAL CONCERN (Continued)	
Mammals (cont.)			
Yuma myotis *Myotis yumanensis*	FSC/CSC	Roosts with other species in buildings, mines, caves and crevices, feeding on flying insects; found in a wide variety of habitats ranging from sea level to 3300 m (11,000 ft), but it is uncommon to rare above 2560 m (8000 ft); optimal habitats are open forests and woodlands with sources of water over which to feed.	**Low Potential.** No reported occurrences. Suitable habitat for this species does not occur within the project area.
Birds			
Burrowing owl *Athene cunicularia*	FSC/CSC	Open, flat, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation with ground squirrel burrows.	**Low Potential.** Reported in vicinity of Playa Del Rey at junction of Culver Blvd. and Jefferson Blvd.
Reptiles			
Southwestern pond turtle *Clemmys marmorata pallida*	FSC/CSC	Lakes, ponds, reservoirs, and slow-moving streams and rivers, primarily in foothills and lowlands.	**Low Potential.** Reported at Marina Del Rey in 1987. No suitable habitat at PDR and MDR Lots.
Invertebrates			
Sandy beach tiger beetle *Cicindela hirticollis gravida*	FSC/--	Clean, dry light-colored sandy areas adjacent to non-brackish water.	Observed on Dockweiler Beach at Playa Del Rey in 1979 about 1/3 mile west of project site.
Globose dune beetle *Coelus globulus*	FSC/--	Foredunes and sand hummocks; burrowing beneath sand surface commonly under dune vegetation.	**Low to Moderate.** Historically occurred on foredunes bordering Dockweiler Beach. Marginally suitable habitat occurs at Cluster 12 (Marina Del Rey).
		SPECIES ON OTHER LISTS	
PLANTS			
Southern tarplant *Centromadia parryi ssp. australis*	--/--/1B	Margins of marshes and swamps, in grassland, and in vernal pools often on disturbed sites.	**Low Potential.** Occurred at Ballona marshes at Marina Del Rey in early 1900's; not observed in 1997. No suitable habitat at PDR and MDR Lots.
Orcutt's pincushion *Chaenactis glabriuscula var. orcuttiana*	--/--/1B	Coastal bluff scrub and coastal dunes.	**Low Potential.** Reported at Dockweiler Beach at Playa Del Rey in 1980. No suitable habitat at PDR and MDR Lots.

TABLE C-1 (Continued)
POTENTIAL OCCURRENCE OF SPECIAL STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR and MDR LOTS

Common Name ***Scientific Name***	**Status** **FWS/CDFG/CNPS**	**General Habitat**	**Potential to Occur at PDR and MDR Lots**
		SPECIES ON OTHER LISTS (Continued)	
Plants (cont.)			
Coulter's goldfieds *Lasthenia glabrata ssp. coulteri*	--/--/1B	Coastal salt marshes and swamps, grassland, and vernal pools often on alkaline soils.	**Low Potential.** Occurred at Ballona marshes at Marina Del Rey in early 1900's; not observed in 1981. No suitable habitat at PDR and MDR Lots.
Brand's phacelia *Phacelia stellaris*	--/--/1B	Open areas of coastal scrub and coastal sand dunes.	**Low Potential.** Historically occurred at Playa Del Rey in the 1940's. No suitable habitat at PDR and MDR Lots.
Ballona cinquefoil *Potentilla multijuga*	--/--/1A	Brackish meadows and seeps in Los Angeles County.	**Low Potential.** Occurred at Ballona marshes at Marina Del Rey in late 1800's; possibly extirpated.
ANIMALS			
Invertebrates			
Belkin's dune tabanid fly *Brennania belkini*	--/*	Coastal sand dunes.	**Low Potential.** Known to occur at El Segundo Dunes in 1987 and Playa Del Rey east of Vista Del Mar in 1980.
Monarch butterfly *Danaus plexipus* (overwintering sites)	--/*	Dense, wind protected tree groves (eucalyptus, Monterey pine, Monterey cypress) near the coast from northern Mendocino to Baja California.	**Moderate Potential.** Numerous observed in 1988, 1990 and December 1997 in dense eucalyptus grove on the south edge of Ballona wetlands. Marginally suitable habitat for this species occurs at Cluster 9.
Henne's eucosman moth *Eucosma hennei*	--/*	Endemic to El Segundo Dunes.	**Low Potential.** Reported to occur at El Segundo Dunes west of LAX airport in 1984.
Lange's El Segundo dune weevil *Onychobaris langei*	--/*	Coastal sand dunes, endemic at El Segundo dunes.	**Low Potential.** Historically occurred at El Segundo Dunes west of LAX airport in 1938.
Salt marsh skipper *Panoguina errans*	--/*	Coastal salt marsh - host plants include *Spartina* sp. or *Distichlis spicata*- flight season is June - September.	**Low Potential.** Occurs at Ballona salt marsh. No suitable habitat at PDR and MDR Lots.
Dorothy's El Segundo dune weevil *Trigonoscuta dorothea*	--/*	Coastal sand dunes in Los Angeles County.	**Low Potential.** Reported to occur at El Segundo Dunes west of LAX airport and south of Ballona Creek in 1980.

TABLE C-1 (Continued)
POTENTIAL OCCURRENCE OF SPECIAL STATUS SPECIES AND SENSITIVE HABITATS AT THE PDR and MDR LOTS

Common Name ***Scientific Name***	**Status** **FWS/CDFG/CNPS**	**General Habitat**	**Potential to Occur at PDR and MDR Lots**
		SPECIES ON OTHER LISTS (Continued)	
Invertebrates (cont.)			
Mimic tryonia (=California brackishwater snail) *Tryonia imitator*	--/*	Coastal lagoons and salt marshes from Sonoma County south to San Diego County.	**Low Potential.** Reported to occur along Ballona Creek in 1974. No suitable habitat at PDR and MDR Lots.
		SENSITIVE HABITATS	
Southern coastal salt marsh	--/S2.1/--	Typically, *Frankenia* sp., *Suaeda*, and/or *Salicornia* subterminalis often occur along the upper landward edges of the marshes; *Salicornia bigelovii*, *S. virginica* and *Batis maritima* at middle elevations; and *Spartina* closest to open water.	**Absent.** Occurs at mouth of Ballona Creek, between Marina Del Rey on the north and Del Rey Bluffs on the south; creek diked and marsh does not get regular tidal flow.
Southern dune scrub	--/S1.1/--	Dominant species at El Segundo Dunes include *Ericameria ericoides, Lupinus chamissonis, Isomeris arobrea, Rhus integrifolia, Eriogonum parvifolium.*	**Absent.** El Segundo Dunes, west of LAX airport.

Status Codes:

Federal Categories (U.S. Fish and Wildlife Service)

FE = Listed as Endangered by the Federal Government

FT = Listed as Threatened by the Federal Government

FPT = Federally proposed for listing as Threatened

FSC = Federal Special Concern Species (former Category 2 candidates)

State Categories (California Dept. of Fish and Game)

CE = Listed as Endangered by the State of California

CT = Listed as Threatened by the State of California

CSC = State Special Concern Species

* = California Department of Fish and Game, Natural Diversity Database. January 2003. Special Animals List. Biannual publication, Mimeo.
3511 = Fully protected species (California Fish and Game Code).
3503.5 = Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls).

High Potential = Species expected to occur and meets all habitats as defined in list.
Moderate Potential = Habitat only marginally suitable, or considered suitable but not in species geographic range.
Low Potential = Habitat does not meet species requirements as currently understood in the scientific community.
-- = No listing status.

SOURCE: CDFG 2003; CDFG California Wildlife Habitat Relationship (WHR);

PROTECTION OF RAPTORS

Birds of prey are protected in California under the California Fish and Game Code, §3503.5. Under §3503.5, it is unlawful to take, possess, or destroy any raptors or owls or to take, possess, or destroy the nest or eggs of raptors or owls. Disturbance that causes nest abandonment or loss of reproductive effort is considered a taking by the CDFG. Construction disturbance during the breeding season can result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Any loss of fertile eggs or nesting raptors or any activities resulting in nest abandonment are considered a significant impact.

CALIFORNIA NATIVE PLANT SOCIETY

Vascular plants may be listed as rare or endangered in the California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California, even if those species are not listed under CESA or FESA. Lists produced by CNPS are subject to extensive scientific review and are recognized by botanists with the state and federal government as authoritative. Under CEQA, plants on List 1B can be treated as if they are state or federally listed. These species are categorized as follows:

- List 1A. Plants presumed extirpated in California
- List 1B. Plants Rare, Threatened, or Endangered in California and elsewhere
- List 2. Plants Rare, Threatened, or Endangered in California, but more numerous elsewhere
- List 3. Plants About Which We Need More Information - A Review List
- List 4. Plants of Limited Distribution - A Watch List

LOCAL

LOS ANGELES COUNTY

Pursuant to Title 22, Part 16, Section 22.56.2060, Los Angeles County requires an oak tree permit for any activity that involves cutting, destroying, removing, relocating, inflicting damage[11] or encroaching into a protected zone[12] of any *tree* of the *oak* genus which is (a) 25 inches or more in circumference (eight inches in diameter) as measured four and one-half feet above mean natural grade; in the case of an *oak* with more than one trunk, whose combined circumference of any two trunks is at least 38 inches (12 inches in diameter) as measured four and one half feet above mean natural grade, on any lot or parcel of land within the unincorporated area of Los Angeles County, or (b) any *tree* that has been provided as a replacement *tree*, pursuant to Section 22.56.2180, on any lot or parcel of land within the unincorporated area of Los Angeles County, unless an *oak tree* permit is first obtained.

Los Angeles County (County) drafted an amended Protected Tree Ordinance (Title 22- Planning and Zoning of the Los Angeles County Code) on the January 10, 2002. In addition to protecting oak trees, the

[11] "Damage" includes any act causing or tending to cause injury to the root system or other parts of a tree, including, but not limited to, burning, application of toxic substances, operation of equipment or machinery, or by paving, changing the natural grade, trenching or excavating within the protected zone of an oak tree.

[12] "Protected zone" shall mean that area within the dripline of an oak tree and extending there from to a point at least five feet outside the dripline, or 15 feet from the trunks of a tree, whichever distance is greater. (Ord. 88-0157 § 2, 1988: Ord. 82-0168 § 2 (part), 1982.)

proposed draft amendment would establish regulations to preserve California walnut and western sycamore, as well as modify encroachment exemptions. This proposed draft amendment has not been adopted (Starks, L. Los Angeles County Department of Regional Planning, pers. comm., July 8, 2003.

CITY OF LOS ANGELES

The following regulation is set forth in the City of Los Angeles Municipal Code:

"No person shall relocate the or remove any oak tree, as that term is defined in Section 46.01, where the said oak tree is located on a lot larger than one acre and is not regulated pursuant to Article 7 of Chapter I of this Code, without first having applied for and obtained a permit…" (City of Los Angeles Municipal Code, Chapter IV, Article 6, Section 46.02).

BIOLOGICAL SETTING

The Marina del Rey (MDR) and Playa del Rey (PDR) lots are situated within an urban environment and lie outside the boundaries of the Coastal Zone (see Section 10, Land Use and Planning). The MDR lot (Cluster 12) lies north of the Marina del Rey Entrance Channel. The site is bordered by residential apartment buildings on the north and south, Venice Beach on the west, and an alleyway on the east. The Cluster 12 site supports a small degraded coastal dune scrub plant community. The site was seeded with an ornamental wildflower mix, but also supports some native species, including dune tansy (*Tanacetum camphoratum*). Dominant non-native species observed include iceplant (also commonly referred as hottentot fig) (*Carpobrotus edulis*) and barley (*Hordeum* sp.). Sea rocket (*Cakile edentula*), a common non-native dune plant, was also observed. The site was heavily disturbed in the past.

The PDR lots (Clusters 1-11) are located on the southern California coast approximately one-half mile south of the Ballona wetlands, one mile east of Dockweiler Beach State Park, and one mile north of the northern boundary of Los Angeles International Airport (LAX). The Playa del Rey lots are on the plateau of a coastal bluff from which a steep cliff descends approximately 100 feet to Ballona Creek and its associated wetlands. The bluff itself is relatively flat with very little aspect. The Ballona Creek area primarily supports non-degraded and degraded wetlands, agricultural fields (which were former wetlands) and environmental sensitive upland areas as designated by the California Department of Fish and Game (Los Angeles County, 1995). A residential and private open space buffer zone separates the Playa del Rey project lots from the Ballona Creek wetlands area.

The PDR lots are of varying sizes. Most sites are surrounded by residential uses such as adjacent lots with one-family residences or small apartment buildings and residential streets. All of the sites at PDR support primarily non-native, landscaped vegetation on disturbed sandy soils. The dominant plant species observed include iceplant, English ivy (*Hedera helix)*, and landscaping lawn grass. Eucalyptus (*Eucalyptus globulus*) is the dominant tree species observed at most of the sites. Some sites have been mowed completely or partially for aesthetics and fire reduction. In non-mowed areas, ruderal vegetation has established, including non-native annual grasses and herbs.

COMMON WILDLIFE

Very few wildlife species were detected during the surveys (Chambers, August 2000). Those detected and expected at the site are indicative of the urban landscaping that covers the project area. Wildlife species observed include those typical of urban areas, including American crow, sparrow, house finch, European starling, domestic pigeon and rock dove. Common insects, including ants, honey bee and solitary bee, were also observed at most of the sites. Trees larger than 12 inches diameter at breast height (DBH) were surveyed for the presence of raptor nests. No raptor nests were present. Although many native bird species inhabit the Ballona wetlands near the project, the lots included in the scope of this Initial Study provide little or no biological value to those species that may be found in the Ballona wetlands. No native mammal species were detected during the surveys, other than domestic dogs (*Canis familiaris*) and cats (*Felis domesticus*). Mammals that may inhabit the sites included the black and Norway rat (*Rattus rattus* and *R. norvegicus*) and the house mouse (*Mus musculus*).

SPECIAL STATUS SPECIES

Based on electronic database searches using California Natural Diversity Data Base (CNDDB) (CDFG, 2003), and California Native Plant Society Electronic Inventory (CNPS 2003), 31 species were considered in evaluating potential occurrence of special status species at the PDR and MDR lots. These included eight special status plants and 23 special status animal species.

No suitable habitat is present for any special status plant species due to the disturbed nature of the sites, including urban landscaping and grading for well installation and abandonment, and presence of invasive plant species at the PDR and MDR lots. There are no wetlands present to support Ventura marsh milk-vetch, southern tarplant, Coulter's goldfields or Ballona cinquefoil. Although special status plant species that occupy coastal dune habitats have historically occurred within the project vicinity, these species (including San Fernando Valley spineflower, beach spectaclepod, Orcutt's pincushion, and Brand's phacelia) have low potential occurrence.

Several special status invertebrate species are known to occur southwest of the PDR site near LAX airport. No host-plants (i.e., *Eriogonum parvifolium*) to support El Segundo butterfly were observed at the project site. However, the MDR (Cluster 12) project potentially supports marginally suitable habitat for special status beetles and other invertebrates. The Samarkand site (Cluster 9) supports an abundance of eucalyptus trees which potentially supports overwintering monarch butterfly, a special status species.

ESA conducted biological reconnaissance surveys in March 2003 at the MDR and PDR lots to update past reconnaissance surveys conducted by Chambers Group in March 2000. Both the 2003 and 2000 surveys documented existing biological conditions and assessed potential habitat to support special status plant and wildlife species. Entomological Consulting conducted species-specific surveys for globose dune beetle in June 2003. The MDR site (Cluster 12) supports the globose dune beetle, a federal species of concern, on a small degraded central dune scrub plant community (Arnold, R. A., pers. comm., June, 2003). A portion of this site was seeded with an ornamental non-native wildflower mix and is watered during the dry season. The introduction of non-native species, increased vegetation cover (especially on the degraded central dune scrub habitat inhabited by the beetle), and ground saturation (out of the normal

rainy season period) are factors that currently affect the beetle. Potentially significant impacts on the globose dune beetle will be analyzed further in the EIR.

Burrowing owl is a federal and state species of concern found throughout much of southern and central California, and has been observed within five miles of the area. This species often inhabits open areas with low-growing shrubs and has been observed in areas at the edge of cities. In March 2000 the Chambers Group conducted burrowing owl surveys which were equivalent to Phase I, II, and III of the protocol surveys developed by the Santa Cruz Predatory Bird Research Group (Chambers Group, August 2000). Results of past reconnaissance surveys conducted by Chambers Group in adjacent undisturbed areas indicated that small numbers of burrowing owls may inhabit “fringe” areas of sites along Calabara Avenue (near Cluster 10 and 11) and 79th Street (near Cluster 8). However, no burrowing owls or burrows for burrowing owls were observed during the March 2000 site visit (Chambers Group, August 2000).

Chambers Group (August 2000) conducted an inventory of trees with a diameter at breast height (DBH) of greater than six inches in March 2000 (Table C-2).

TABLE C-2
TREE INVENTORY AT THE PDR and MDR LOTS

Location (by Cluster Number)	Common Name	Scientific Name	Number of Trees Present (DBH >6")
Cluster 1	Fig	*Ficus* sp*	1
	Blue elderberry	*Sambucus mexicana*	1
Cluster 2	Eucalyptus	*Eucalyptus globulus**	9
Cluster 3	Victorian box	*Pittosporum undulatum**	3
	Smooth Arizona cypress	*Cupressus glabra**	3
	Eucalyptus	*Eucalyptus globulus**	6
Cluster 4	Bishop pine	*Pinus muricata**	3
	California redwood	*Sequoia sempervirens**	4
	Leyland cypress	*Cupressocyparis leylandii**	4
Cluster 5	Fig	*Ficus* sp*	2
	Canyon live oak	*Quercus chrysolepis*	1
	Maackia	*Maackia chinensis**	1
	Kangaroo thorn	*Acacia paradoxa**	5
	Palm	*Arecaceae*	3
Cluster 6	Bosnian pine	*Pinus leucodermis**	4
	Eucalyptus	*Eucalyptus globulus**	11
	Eastern red cedar	*Juniperus virginiana**	1
	Cypress	*Chamaecyparis* sp*	7
	Elm	*Ulmus* sp*	2
Cluster 7	Fig	*Ficus* sp*	1
Cluster 8	Carrotwood	*Cupaniopsis anacardioides**	2
	Brazillian peppertree	*Schinus terebinthifolius**	1
	Eucalyptus	*Eucalyptus globulus**	12
Cluster 9	Eucalyptus	*Eucalyptus globulus**	23
Cluster 10	Benjamin fig	*Ficus Benjamina**	1
	Trochodendron	*Trochodendron araliodes**	1
Cluster 11	Eucalyptus	*Eucalyptus globulus**	3
Cluster 12	--	--	0

* Indicates non-native to California or local area

SOURCE: Chambers Group, August 2000

APPENDIX D

CULTURAL AND HISTORICAL BACKGROUND INFORMATION

APPENDIX D

CULTURAL AND HISTORICAL BACKGROUND INFORMATION

HISTORY

The project area is located within territory occupied by the Gabrielino Native American group when Europeans first arrived in the region (Chambers, August 2000). Gabrielino settlement and subsistence patterns may extend back to the beginning of the late Prehistoric period, about A.D. 750. The Gabrielino were semi-sedentary hunters and gatherers.

Coastal groups collected shellfish and fished for estuary, nearshore, and kelp bed species. Dried fish and shellfish were exchanged for inland products such as acorns. The nuts were pounded into flour using stone mortars and pestles and then cooked as soup or gruel. Seeds from sage, grasses, goosefoot, and buckwheat were ground with stone manos and metates. Deer, rabbits, birds, and marine mammals were hunted with bow and arrow, nets, traps, and snares.

The Gabrielino lived in villages of up to 150 people located near permanent water sources and a variety of food resources (Chambers, August 2000). The village acted as the center of a territory from which resources were gathered. Small groups left the village for short periods to hunt, fish, and gather plant foods, as well as collect raw materials for tools, housing, and other utilitarian needs.

The period from 1000 B.C. to A.D. 750 is known as the Intermediate Period (Chambers, August 2000). During this period, mortars and pestles appear, indicating the beginning of acorn exploitation. Use of the acorn - a high-calorie, storable food source - probably allowed greater sedentism and a higher level of social organization. Large projectile points indicate that the bow and arrow, a hallmark of the Late Prehistoric Period, had not yet been introduced, and hunting was likely accomplished using the *atlatl* (spear thrower) instead. Settlement patterns during this time are not well understood. The semi-sedentary settlement pattern characteristic of the Late Prehistoric Period may have begun during the Intermediate Period, although lower population densities may have limited local territoriality.

The Milling Stone Period (about 6500 B.C. to 1000 B.C.) represents a long period of time characterized by smaller, more mobile groups, compared with later periods. These groups probably relied on a seasonal round of settlement, which included both inland and coastal residential bases (Chambers, August 2000). Seeds from sage and grasses, rather than acorns, provided calories and carbohydrates.

Although the Spanish inaugurated their system of missions in *Alta California* in 1769, the first Spanish explorers in this region visited the coastline much earlier (Chambers, August 2000). Juan Rodriguez Cabrillo arrived first in 1542, followed by Pedro de Unamuno in 1587, Sebastian Rodriguez Cermeño in 1595, and Sebastian Vizcaíno in 1602. After Vizcaíno's visit, 167 years passed without European exploration of the *Alta California* coastline until the first mission, at San Diego, was founded on the heels

of the Gaspar de Portolá land expedition in 1769 (Chambers, August 2000). Native American inhabitants of the Los Angeles Basin were taken to Mission San Gabriel, constructed in 1771 (Chambers, August 2000), and were called *Gabrielinos* by the Spanish because of their association with the mission.

The Spanish government made several large land grants in the Los Angeles Basin, but much of the land was not granted until Mexico gained independence in 1822 and the mission holdings were secularized in 1834. The current project area is located near the historic boundary between two Mexican ranchos: the 22,459-acre Sausal Redondo grant of 1837, and the 13,920-acre Ba1lona grant of 1839 (Chambers, August 2000). The Ba1lona rancho may have carried over from an earlier Spanish grant (Chambers, August 2000), with the name derived from the claimants' home city of Bayona in northern Spain (Chambers, August 2000). The smaller 2,219-acre Aguaje de la Centinela grant of 1844 (Chambers, August 2000) was situated just east of the project area.

During the Mexican administration of *Alta California*, the early pueblo of Los Angeles was located in the area west of the present Union Station downtown (Chambers, August 2000). The rest of the surrounding lands were divided into ranchos largely devoted to livestock and cultivation. California became an American state in 1850, but the population of southern California remained relatively low through the 1860s and 1870s, with cattle ranching continuing as the principal economic activity. However, a period of drought and expensive land title defense cases in U.S. courts resulted in the sale of many of the cattle ranches to Anglo-Americans.

Immigration to southern California increased substantially after Los Angeles was connected by the Southern Pacific Railroad to the transcontinental Central Pacific Railroad in San Francisco in 1876 (Chambers, August 2000). The Southern Pacific Railroad completed its own transcontinental connection from Los Angeles through Yuma in 1881 (Chambers, August 2000). During the 1880s, towns were hastily formed and land was sold to new arrivals from the east by real estate developers. Land speculation escalated as the second transcontinental railroad, the Atchison, Topeka, and Santa Fe, reached Los Angeles in 1886. The two railroads vied for customers by waging a fare war, encouraging many people to move to southern California.

The original Ba1lona Lagoon (now Marina del Rey) was proposed several times as the location of a commercial port facility for Los Angeles (Chambers, August 2000). With backing from the Santa Fe Railroad, Moses L. Wickes made the first proposal in 1886, investing $300,000 in the "La Ba1lona" project (Chambers, August 2000). The attempt failed, but the idea was revived under the name Playa del Rey in 1902 (Chambers, August 2000). The U.S. Army Corps of Engineers studied the lagoon in 1916, but concluded that its development as a commercial harbor was not feasible. The Los Angeles County Board of Supervisors commissioned another study in 1936, but later decided to concentrate all commercial port facilities at Los Angeles and Long Beach Harbors. During the late 1940s, the Corps of Engineers initiated a feasibility study for a recreational boat harbor at the lagoon. The Marina del Rey harbor and channel were created by dredging the lagoon, but the marina and associated breakwater were not completed until 1965 (Chambers, August 2000).

The first producing well in the Playa del Rey gas storage field was completed in 1929. By 1930, the field contained 141 producing wells. During 1934 and 1935, 50 additional wells were drilled in the Del Rey Hills area. During World War II, the federal government assumed control of the field. The Southern

California Gas (SCG) Company began operations after acquiring the field in 1953 as surplus government property (Chambers, August 2000). Since that time, parcels not occupied by gas wells have been developed as residential properties.

Three historic resources located within one mile of the Marina del Rey / Venice portion of the project area are listed on the National Register of Historic Places, including the Venice Canal Historic District, Warren Wilson Beach House, and American Trona Corporation building (Chambers, August 2000). All three are located north of and beyond the project area. The Venice Canals were created in 1905 as part of a unique residential subdivision. The Venice Canal System is also listed as City of Los Angeles Historic-Cultural Monument No. 270. The Warren Wilson Beach House is also located in Venice. The American Trona building was constructed in 1916 as a storage facility for raw salt.

Twelve additional historic resources are located within one mile of the overall project area, including a streetcar depot and 11 residential structures (Chambers, August 2000). None of these resources have been listed on the National Register of Historic Places. None occur within boundaries of the project area.

There are no California Historical Landmarks or California Points of Historical Interest listed within a one-mile radius of the overall project area (Chambers, August 2000). One of the prehistoric archaeological sites located within a one-mile radius of the project area, CA-LAN-47, is also listed as City of Los Angeles Historic-Cultural Monument No. 490, the site of the Gabrielino village of *Sa-Angna*.

ARCHEOLOGICAL

The Gabrielino lived in villages of up to 150 people located near permanent water sources and a variety of food resources (Chambers, August 2000). While away from the village, they established temporary camps and resource processing locations (Chambers, August 2000). Archaeologically, such locations are marked by bedrock mortars for acorn processing, manos and metates for seed grinding, and flaked lithic scatters indicating the manufacturing or maintenance of stone tools (usually of chert) used in hunting or butchering. Overnight stays in these field camps are indicated by fire-affected rock resulting from use in hearths (Chambers, August 2000).

The period from 1000 B.C. to A.D. 750 is known archaeologically as the Intermediate Period (Chambers, August 2000). During this period, mortars and pestles appear, indicating the beginning of acorn exploitation.

The Milling Stone Period (about 6500 B.C. to 1000 B.C.) represents a long period of time characterized by smaller, more mobile groups, compared with later periods. Although fewer projectile points occur (compared with later periods), faunal remains indicate that similar animals were hunted. Inland Milling Stone Period sites are characterized by numerous llanos, metates, and hammerstones, while shell middens are common at coastal sites. Coarse-grained lithic materials, such as quartzite and rhyolite, are more common than fine-grained materials, such as chert, in flaked stone tools from this time.

BALLONA WETLANDS PREHISTORY

Recent studies of landscape evolution in the Ballona Wetlands area of Southern California has revealed more detailed settlement information unique to the Westchester Bluffs. Homburg et al. (2001) conducted geoarchaeological analysis though extensive augering to reconstruct the succession of landforms and their effect on human occupation. Three distinct cultural adaptations were identified as they related to a particular stage of landscape and lagoonal development over the last 7,000 years:

1) Early Period (7,000-3,000 B.P.) marked by short-term, bluff-top occupations overlooking a shallow bay or lagoon;

2) Middle period (3,000-1,000 B.P.), characterized by an influx of population distributed on bluff-top and creek-edge settings; and

3) Late period (1,000-200 B.P.), marked by population aggregation around the lagoon.

Estuarine conditions prevailed at the present-day Ballona Wetlands until the lagoon development began around 6,200 B.P., when the lagoon began to slowly fill with alluvium up to around 2,000 B.P. As a result, human settlement tended to move westward through time; initial occupation began on the Baldwin Hills, shifted in the Middle Period to the Westchester Bluffs, and ended with large settlements at the mouth of Centinela Creek and the Ballona Lagoon (Homburg et al. 2001).

ARCHIVAL METHODS

A records search of all pertinent survey and site data was conducted at the South Central Coastal Information Center, Fullerton, California. The records were accessed by utilizing the Venice, Calif. USGS 7.5-minute quadrangle map, unsectioned, Township 2S, Range 15W. The review included the Playa Del Rey and Marina Del Rey sites along with a ¼ mile buffer that constituted the Project Area. Previous surveys and studies and archaeological site records were accessed as they pertained to the Project Area. Properties listed in the National Register of Historic Places, the California Register of Historic Resources, the California Inventory of Historic Resources (1976), the California Historical Landmarks (1996), and the California Points of Historical Interest (1992) were searched from within the project area.

ARCHIVAL FINDINGS

Twenty-eight archaeological sites have been recorded within a one-mile radius of the project area. Of these, 23 are prehistoric archaeological sites and 6 are historic archaeological sites.

Five of the prehistoric sites are located within the boundaries of the Playa del Rey portion of the project area are identified as follows: CA-LAN-63, CA-LAN-64, CA-LAN-65, CA-LAN-203, CA-LAN-204, and CA-LAN-206. These sites are summarized below in Table D-1. All five are situated in the eastern half of this portion of the project area, between Gulana Avenue on the west and Hastings Avenue on the east. This area is located on top of the bluff that overlooks the Ballona Creek drainage to the north. The locations of the 36 parcels, which are to be sold, have been compared with the mapped locations of these five sites currently known within the project area. None of the parcels occur within known boundaries of

the five archaeological sites. Thus, sale and subsequent development of these parcels will not pose an adverse impact on any of these known resources.

No archaeological sites have been recorded within the Marina del Rey/Venice portion of the project area. Prehistoric archaeological sites are not expected within the former Ballona Lagoon and wetlands, which were dredged and filled in 1965 to form the marina.

TABLE D-1
PREHISTORIC ARCHAEOLOGICAL SITES RECORDED WITHIN THE PLAYA DEL REY PORTION OF THE PROJECT AREA

SCCIC Designation	Initially Recorded	Site Type	Site Description
CA-LAN-63	06 / 05 / 50	Village Site	Ground stone artifacts; midden soils
CA-LAN-64	06 / 05 / 50	Habitation site	Ground and flaked stone artifacts and shell
CA-LAN-65	06 / 05 / 50	Habitation site	Ground and flaked stone artifacts and shell
CA-LAN-203	06 / 05 / 53	Seed processing site	Ground stone artifacts (metates)
CA-LAN-204	06 / 05 / 53	Not defined	None available
CA-LAN-206	06 / 05 / 53	Seed processing site	Ground stone artifacts (manos, metates, and cogstones)

SOURCE: Chambers, August 2000

SURVEY METHODS AND FINDINGS

The surface of each lot was examined for constituents of archaeological sites, such as artifacts, features or facilities, and/or culturally modified soil horizons. Due to the extensive built setting and landscape cover, visibility of the native surface was minimal to zero. No archaeological materials were identified during this survey.

Because the project is to be located within built environments, the utility of pedestrian archaeological survey methods is diminished due to the lack of native soil and topographic visibility. Moreover, much of Playa Del Rey and Marina Del Rey has been subjected to landfill, which has obscured the visibility of the native surface. Archaeological sites can consist of extensive subsurface components that would be difficult to localize without test excavations. Under such circumstances, construction monitoring by qualified archaeological monitors may be substituted for survey, evaluation/testing, or data recovery.

With respect to historic resources, the nature of the proposed project—that is, the sale of the lots themselves—would not directly or indirectly impact structures or properties. Consequently, no additional measures are required pertaining to built historical resources. Nevertheless, this does not preclude the existence of subsurface historical archaeology in the project area.

PALEONTOLOGIC RESOURCES

The top of the bluff comprising the Playa del Rey portion of the project area is underlain by late Quaternary dune sand (unit Qs), while the slope at the northern margin of the project area is underlain by the marine Palos Verdes Sand, which stratigraphically underlies the dune sand (Chambers, August 2000). The archives of the Natural History Museum of Los Angeles County Vertebrate Paleontology Section (LACMVP) indicate that no fossils have been reported from the dune sand anywhere within the USGS Venice 7.5' Quadrangle. Moreover, no vertebrate fossil site is reported as occurring in the dune sand (Chambers, August 2000). The lack of any previously recorded fossil site suggests that there is only a low potential for late Pleistocene fossil remains occurring in the project area where underlain by dune sand.

However, several previously recorded fossil sites do occur in the Palos Verdes Sand. These include LACMVP fossil site 1024 (Natural History Museum of Los Angeles County Invertebrate Paleontology Section fossil site 59) and others, which occur immediately east of the project area along the western side of Lincoln Avenue (Chambers, August 2000). These fossil sites yielded the fossilized remains of 300 species of late Pleistocene (Ice Age) shallow-water marine invertebrates, including snails and clams; the fossilized bones and teeth of marine vertebrate species, including fishes, sharks, seals, and porpoises; the fossilized bones of birds; and the fossilized bones of a land mammal species (gopher). These fossil occurrences indicate that there is a high potential for late Pleistocene fossil remains occurring along the northern margin of the Playa del Rey portion of the project area where underlain by the Palos Verdes Sand.

By contrast, little or no potential for such fossils is indicated by the geological character of the Marina del Rey/Venice portion of the project area, which is comprised of dune sand and fill materials dredged from Ballona Lagoon during construction of the marina.

HUMAN REMAINS

No human remains are known to exist on the SCG parcels.

HISTORICAL SIGNIFICANCE (AS DEFINED IN §15064.5)

No areas of historical significance are known to exist on the SCG parcels.

REGULATORY SETTING

FEDERAL

Federal legislation requires that federal agencies consider environmental effects to historical and cultural resources prior to authorizing any activity. The National Environmental Policy Act (NEPA) regulations and the National Historic Preservation Act of 1966 (NHPA) specify that environmental evaluations of proposed projects consider historic and cultural resource effects. This review process is referred to as Section 106 review. The Advisory Council on Historic Preservation (ACHP) is responsible for administering the Section 106 review process. The National Register of Historic Places (NRHP) provides

a method for preserving and maintaining cultural resources that meet certain eligibility criteria. In 1971, the President's Executive Order No. 11593 required that all federal agencies initiate procedures to preserve and maintain cultural resources.

STATE

State legislation requires the protection of historical and cultural resources. In 1980, the Governor's Executive Order No. B-64-80 required that state agencies inventory all "significant historic and cultural sites, structures, and objects under their jurisdiction which are over 50 years of age and which may qualify for listing on the National Register of Historic Places."

California Environmental Quality Act Guidelines §15064.5 are used to determine the significance of impacts to archeological and historical resources. The guidelines state that a substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.

The *Westchester-Playa del Rey Plan*, which is part of the *General Plan of the City of Los Angeles*, contains the following provision under Cultural Heritage Resources (City of Los Angeles, June 1974):

> Review potential resource impacts through the County and City's Environmental Guidelines and require appropriate environmental documentation and reasonable mitigation measures as determined by the Department of City Planning and the State Historic Preservation Office.

APPENDIX E

GEOLOGY AND SOILS BACKGROUND INFORMATION

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GEOLOGY AND SOILS BACKGROUND INFORMATION

ENVIRONMENTAL SETTING

INTRODUCTION

The project area lies within the western Los Angeles Basin, about 11 miles west-southwest of downtown Los Angeles and less than 1 mile from the Pacific Ocean. This area includes Marina del Rey (MDR), located between the Ballona Lagoon and Dockweiler State Beach on the Pacific Ocean, and Playa del Rey (PDR), located on a dissected coastal terrace approximately one mile inland from the shore at Playa del Rey. MDR is northwest of Ballona Creek and the Marina del Rey Harbor entrance and PDR is located to the south of Ballona Creek.

The geologic conditions overlying the Playa del Rey gas storage facility (PDRGSF) can affect conditions at the 36 proposed sale lot sites. The geologic and seismic setting of the proposed project could expose people and property to geologic hazards associated with the underlying geology and seismicity of this portion of Los Angeles. Particular to the proposed project is the affect that underlying geologic conditions have on controlling the upward migration of residual petroleum gases that are associated with the underlying oil reservoir and the PDRGSF. Mitigation would be required to detect and control any adverse gas migration or their affects on urban uses and activities.

GEOLOGIC SETTING

Surface geologic features include the Playa del Rey Bluff, a prominent topographic feature in the project area. It is about five miles south of the Santa Monica Mountains and about five miles north of Palo Verde Peninsula hills to the south. The Bluff is a westerly extension of the Baldwin Hills and Fox Hills, three miles to the east. The Bluff represents the southern flank of the ancestral of the Los Angeles River (now Ballona Creek) valley, which formerly flowed through this area (its current course is through Long Beach and San Pedro).

Geologically, the Los Angeles basin is a deep, sediment filled structural depression with recent sedimentary deposits overlying older sedimentary rocks. Beneath the sedimentary rocks are much older crystalline basement rocks, consisting of schists (shales that are altered by heat and pressure). Tectonic forces (those related to faults and earthquakes) beneath the earth uplifted, tilted, and folded the sedimentary rocks. These tectonic forces along both surface faults (e.g., the Newport-Inglewood and related faults) and buried (so-called “blind”) thrust faults (e.g., Torrance-Wilmington, Elysian Park-Puente Hills, Las Cienegas-Coyote Hills, Los Angeles Basin, and Compton-Los Alamitos) formed the chain of hills extending northwest-southeast from north of Los Angeles to the Long Beach.

Many subsurface geologic features within the Los Angeles Basin, such as folds and faults in the rocks, produced geological structures that trapped and accumulated oil and gas, resulting in numerous oil and gas fields. One of these fields is Playa del Rey Field, which underlies most of the proposed project area. Initially, it was the site for oil development, and then later gas storage in this western location of the Los Angeles metropolitan region. In the PDR project area, the Compton blind thrust fault is about 20,000 to 30,000 feet below the site, well below the gas storage zone. Faults can form potential direct or indirect pathways for subsurface oil or gas to move upward into shallower geological formations.

GEOLOGICAL UNITS

At the surface, younger alluvium (Qal) covers areas generally north of the Ballona escarpment (a cliff formed by erosion). South of the escarpment (bluffs), older sand dunes represent an old marine terrace (Qm/Qpu). Active sand dunes are present along the immediate coast. Other geologic units (formations) are not exposed at the surface.

Only the deeper bedrock formations contain the commercial oil or gas producing zones and the Southern California Gas (SCG) Gas Storage Zone. Thickness of these units varies widely across the PDR area. Average thickness reported below is representative of the overall area. The PDR project area includes the following geologic units (from youngest to oldest):

- Surface soils
- Younger alluvium (Qal; poorly to unconsolidated alluvial deposits), including the Ballona Aquifer (“50-Foot Gravel”)
- Active sand dunes (Qsr/Qs) along the coast
- Upper Pleistocene Older Sand Dunes (Qso or Qm/Qpu) and Lakewood Formation (Qlw)
- Lower Pleistocene San Pedro Formation (consolidated alluvium to indurated rock units)
- Tertiary (Pliocene and Miocene) bedrock formations (shales with some oil sands), including Pico and Repetto (Pliocene) Formations, along with Puente and Topanga Formations (Miocene)
- Mesozoic Schist (possibly Jurassic) metamorphosed shale; either of the Santa Monica or Catalina formation

Soils

The only semi-natural soils remaining in the area lie along the exposed undeveloped bluffs and adjacent lowlands between the Bluffs and Ballona Creek. Earthmoving associated with early development of the oil fields and subsequent roads and residential, commercial, and industrial developments have altered the natural soil profiles in the project area. In addition, major earth moving activities (dredging, channelizing, and filling) for Ballona Creek and MDR altered large areas not now designated as wetlands.

Due to the past disruption of natural soil profiles, most, if not all lots are not overlain by intact, native soil profiles. Natural soil profiles where observed along the Bluffs are less than two feet thick, consisting of a

clearly identifiable dark black A-horizon (probably clayey silt, clayey sand, and silty clay in composition) over a thin B-horizon overlying alluvial materials.

Recent Alluvium

The northern part of the PDR project is located in the MDR area. Recent alluvial and near-shore deposits associated with Ballona Creek underlie this area. Recent alluvium includes the Ballona Aquifer, also known as the "50-Foot Gravel," found north of the Ballona escarpment. Recent alluvium overlies the San Pedro Formation. Thickness of alluvium varies from several to about 60 feet. These deposits occur as poorly consolidated and have a moderate to high permeability.

Active Dune Sand

Active sand dunes parallel the coast from the Ballona Escarpment southward to Redondo Beach forming a narrow strip along the coast, 0.2 to 0.5 mile wide. These eolian deposits (deposited by wind), consisting of fine white poorly consolidated, permeable sand, are lenticular in shape, and overlie the older sand dune deposits. Thickness of the dune deposits reaches 70 feet.

Older Dune Sand

Most of the PDR project area is situated largely on the bluffs south of the Ballona escarpment. This elevated area is an ancient marine terrace (Qm/Qpu) covered by older dune sand sedimentary deposits. These sand dunes consist of sand, with silt, clay and gravel lenses. They overlie the Lakewood Formation and range in thickness from several feet to as much as 70 feet. In general, these deposits are poorly consolidated and have a moderate to high permeability.

Lakewood Formation

The Lakewood Formation underlies the Bluffs area. Due to erosion from Ballona Creek (ancestral Los Angeles River) the Lakewood Formation is not present north of the Ballona escarpment. The Lakewood Formation overlies the San Pedro Formation. In the Bluffs area, the Lakewood Formation is approximately 100 feet thick. Lakewood Formation deposits consist of sand, silt, and gravel and may include the Gage Aquifer in the project vicinity. Fine-grained sediments comprise from 40 to 80 percent of the total Lakewood Formation deposits (DWR, 1961).

San Pedro Formation

The San Pedro Formation overlies the Pico Formation in the project vicinity. This geologic unit is found at a depth of approximately 50 feet (MDR area) to 150 feet (Bluffs area) below the surface. It reaches a thickness ranging from about 100 to 150 feet (depth about 150 to 300 feet to top of the Pico Formation).

The San Pedro Formation consists of well-graded sand with gravel interbeds, along with some beds containing fine gravel, sand, and silt. These sands and gravel contain varying amounts of silt and clay. In the project area, the Silverado Aquifer forms the base of the San Pedro Formation.

Bedrock – Pico Formation

The Pico Formation occurs at a depth of about 400 to 500 feet below the surface and is not exposed at the surface within the project vicinity. In the project area, it consists of over 2,000 feet of marine sandstone, siltstone and shale, interbedded with marine gravels (DWR, 1961). Pico Formation shale units form impervious caps or barriers to upward movement of water, oil, and gas, trapping the hydrocarbon deposits within underlying more porous and permeable sandstone beds. High-pressure gas zones encountered during drilling through this sequence of geologic beds are very dense and consolidated.

Bedrock – Repetto Formation

The Repetto Formation is approximately 3,000 feet below the surface and not exposed at the surface within the project vicinity. In the project area, it consists of over 2,000 feet of siltstone and shale, interbedded with layers of sandstone and conglomerate. Sandstone beds within the upper and middle Repetto Formation form the oil productive upper zone found in the MDR (Venice) area. The amount of shale increases with depth. Shale intervals form caps or seals to these productive zones, as well as secondary seals for the deeper gas storage zone.

Bedrock – Puente Formation

The top of the Puente Formation is generally over 5,000 ft deep. It is about 800 feet thick and forms the primary cap rock to the oil producing and gas storage zone. The base of this 7 million year old formation, known as the Nodular Shale, overlies the older oil and gas-producing zone and gas storage zone.

The mostly deep marine formation consists of black to dark gray, and dark brown shale. This clay-rich formation is devoid of any major sand-bearing units (Davis, 2000). Some thin sand lenses and pockets are present in the shale. The thick shale interval is impermeable and forms the primary cap or seal for the PDR oil field and the gas storage zone. Caprock material is composed of hard to medium hard, massive to platy shale.

Bedrock – Topanga Formation

The Schist Conglomerate is part of the Topanga Formation (Davis, 2000). This is the primary reservoir for the PDR oil field and the gas storage zone at a depth of about 6,000 feet. The Topanga Formation is sandstone and conglomerate of terrestrial origin, overlying the Catalina Schist basement complex. Since the Schist Conglomerate was deposited in low areas atop the eroded basement rock, is does not underlie the entire project area.

Basement Rock – Santa Monica or Catalina Schist

Santa Monica Schist or Catalina Schist are names applied to basement rock underlying the project area and most of the Los Angeles Basin. In the project area, basement occurs at depths greater than 6,000 feet. The overlying Topanga Formation deposited on the schist is an irregular erosional surface.

STRUCTURE AND SEISMICITY

Compression between the North American and Pacific plates creates tectonic forces that shape many of the surface features we see today. When forces along the plate boundary increase to the point of failure, earthquakes occur and often times, the displacement experienced deep in the earth where the failure occurs translates at the surface as surface fault rupture. Several active and potentially active faults are located within the project vicinity. Regional tectonic stresses also uplifted, tilted, and folded sedimentary rock units in the project area, creating hills and related geologic structures. A chain of hills formed by these tectonic forces extends from north of Los Angeles, southeast to the Santa Ana River. Geologic structures underlying many hills are often elongated domes or anticlines, similar to those underlying Fox Hills and Baldwin Hills.

Folding

In the PDR project area, the thick sedimentary sequence of sedimentary rock layers is gently folded into a broad anticline (elongated dome or convex upward folded geologic structure). Some minor faults may be associated with this structure (Davis, 2000). Along with stratigraphic (depositional) confinement, the anticline forms a structural trap for oil and gas accumulation within the PDR oil field.

Faulting

Faults are fractures or lines of weakness in the earth's crust. Faults that allow landmasses to move horizontally past each other are strike-slip faults (e.g. San Andreas, San Jacinto, Elsinore, and Newport-Inglewood). In contrast, vertical movement occurs along normal, reverse and thrust faults. Buried low angle thrust faults that do not rupture the surface are known as blind thrusts, for example the Elysian Park Thrust Fault (also known as the Elysian Park Fold and Thrust Fault, the Elysian Park blind thrust fault) and Torrance-Wilmington Fold and Thrust Belt. Faults exhibiting both vertical and horizontal movement are oblique faults (e.g. Santa Monica-Hollywood, Cucamonga, Palos Verdes, and Raymond Faults and Fault Zones). Major fault zones in Southern California within approximately 50 miles of the site are summarized in Table E-1. Other faults defined within a 5 mile radius of the site include the northwesterly-trending Newport-Inglewood, Palos Verdes, Overland Avenue, and Charnock faults. Within the PDRGSF area and the Storage Zone Area of Influence (within one mile of the Main Facility), two sets of minor faults extend through in the following units:

- Catalina Schist and Schist Conglomerate, southeast corner of Section 27, T2S R15W, at depths greater than 4,000 ft below ground surface,
- Catalina Schist and Schist Conglomerate, northwest corner of Section 27, T2S R15W, at depths greater than 4,000 ft below ground surface.

The Charnock fault, the nearest documented fault in the project vicinity, is located about 1.5 miles east of the proposed project area, near the San Diego Freeway (Interstate 405). It extends southeast from near Venice Boulevard toward the City of Gardena (DWR, 1961). This fault is vertical, trending approximately N35W, with the northeast side downthrown relative to the southwest side. The documented length of this fault is about six miles (10 kilometers). The Charnock fault displaces lower aquifers and acts as a partial barrier to groundwater movement (DWR, 1961). It is classified as a

TABLE E-1
DETERMINISTIC EARTHQUAKE SITE PARAMETERS

Abbreviated Fault Name	Approximate Distance Miles (Kilometers)	Estimated Maximum Earthquake: Maximum Earthquake Magnitude (Mw)	Estimated Maximum Earthquake: Mean Values: Peak Ground Acceleration (g.)	Estimated Maximum Earthquake: Mean Values: Estimated Site Intensity [a]
Palos Verdes	4.1 (6.6)	7.1	0.424	X
Newport-Inglewood (L. A. Basin)	5.9 (9.5)	6.9	0.340	IX
Compton Thrust	6.2 (9.9)	6.8	0.591	X
Santa Monica	6.3 (10.2)	6.6	0.362	IX
Malibu Coast	7.2 (11.6)	6.7	0.346	IX
Hollywood	8.6 (13.8)	6.4	0.272	IX
Elysian Park Thrust	14.1 (22.7)	6.7	0.307	IX
Anacapa-Dume	14.8 (23.8)	7.3	0.260	IX
Raymond	16.6 (26.7)	6.5	0.156	VIII
Verdugo	18.0 (28.9)	6.7	0.161	VIII
Northridge (E. Oak Ridge)	18.0 (29.0)	6.9	0.270	IX
Sierra Madre	21.4 (34.5)	7.0	0.160	VIII
Sierra Madre (San Fernando)	22.6 (36.4)	6.7	0.126	VIII
Whittier	24.1 (38.8)	6.8	0.102	VII
Santa Susana	24.2 (39.0)	6.6	0.109	VII
San Gabriel	26.2 (42.2)	7.0	0.106	VII
Clamshell-Sawpit	29.2 (47.0)	6.5	0.080	VII
Holser	30.2 (48.6)	6.5	0.077	VII
Simi-Santa Rosa	30.7 (49.4)	6.7	0.087	VII
San Jose	32.3 (52.0)	6.5	0.070	VI
Oak Ridge (Onshore)	32.4 (52.2)	6.9	0.095	VII
Chino-Central Ave. (Elsinore)	37.3 (60.1)	6.7	0.068	VI
San Cayetano	37.7 (60.7)	6.8	0.073	VII
Newport-Inglewood (Offshore)	39.5 (63.5)	6.9	0.061	VI
Cucamonga	41.9 (67.5)	7.0	0.075	VII
San Andreas – 1857 Rupture	44.8 (72.1)	7.8	0.101	VII
San Andreas – Mojave	44.8 (72.1)	7.1	0.061	VI
Oak Ridge (Blind Thrust Offshore)	46.1 (74.2)	6.9	0.092	VII
Elsinore-Glen Ivy	46.5 (74.8)	6.8	0.045	VI
Channel Islands Thrust (Eastern)	47.6 (76.6)	7.4	0.131	VIII
Ventura – Pitas Point	48.2 (77.6)	6.8	0.053	VI

[a] Modified Mercalli Intensity

SOURCE: EQFAULT Computer Program (Blake, 2000)

potentially active fault by both the Los Angeles County Seismic Element (1990, Plate 1) and the state fault map (Jennings, 1995).

Historic Seismicity

During the past 230 years (1769 to 1999), Southern California experienced about 20 notable earthquakes (Mw 6.0 or greater; where Mw is the moment magnitude). Six of these events equaled or exceeded M7.0. The three largest earthquakes that occurred within the Los Angeles Basin during recent time are the January 17, 1994, Mw 6.7 Northridge earthquake; the October 1, 1987, Mw 5.9 Whittier-Narrows earthquake; and the February 9, 1971, Mw 6.4 San Fernando earthquake. The shortest distance from the site to the energy release zone (site-to-source distance) in these earthquakes is about 18, 22 and 31 miles, respectively.

On 16 June 1920, a magnitude 5.0 earthquake occurred west of Inglewood. The origin of this event was the Newport-Inglewood fault, approximately 13 miles to the east. On 10 March 1933, the 6.3 magnitude Long Beach earthquake occurred about 36 miles to the south near Huntington Beach. Local faults, such as the Charnock and Overland Avenue, could be sources for aftershocks, but would be less likely to generate unique earthquakes than the Newport-Inglewood or Compton blind thrust.

Peak horizontal ground acceleration (PHGA) estimates indicate that the earthquake-induced ground motion would be generated by a Mw 6.9 event on the underlying Compton Thrust fault or an Mw 7+ event on the Newport-Inglewood fault. The California Geological Survey (CGS) prepared the state-planning scenario for a major earthquake on the Newport-Inglewood fault zone assumes a magnitude 7 earthquake that could subject the project area to seismic intensity (Modified Mercalli Intensity) of 8+ to 9 (VIII+ to IX) (Toppozada, et al, 1988). In 1933, the project site area experienced an intensity of VII+ during the 6.3 magnitude Long Beach earthquake. Even though no specific analysis has been conducted to determine actual values, a future earthquake on the buried thrust located directed under the site area may generate higher ground motion intensity than experienced during the 1933 event.

GEOLOGIC AND SEISMIC HAZARDS

Fault Rupture

Surface fault rupture can occur in cases where earthquakes are large or hypocenters location of actual fault failure are shallow. The California Geological Survey (CGS) defines “active” faults as those offsetting materials less than 10,000 to 12,000 years old or exhibiting significant seismic activity. “Potentially active” faults are those offsetting strata within the last 1.6 million years ago. With the exception of the low angle Elysian Park Thrust Fault, which lies at least 5 kilometers deep (8,000 to 10,000 feet beneath the storage zone), no known active faults underlie the Project area and the Storage Zone. Because surface fault rupture is more likely on active faults, the State of California, through Alquist-Priolo Earthquake Zoning Fault Act, places active faults in zones that restrict development. No Alquist-Priolo zones traverse the proposed project area and the potential for surface fault rupture at the site is considered very low.

Presently, documentation indicates that the storage zone contains no fault offsets although mapping has inferred two potential fault offsets in Section 27, T2S, R15W. Old reports infer various faults in other areas of the field, but these reports do not provide evidence of their presence. With the exception of the possible faults in Section 27, recent geologic reviews (Davis, 2000) did not provide evidence for the other faults inferred by various reports. The possible faults in Section 27 are not considered active or potentially active. Based on the age of rock formations that may be offset by these faults in Section 27, (Davis, 2000) indicates that they are confined to depths greater than 4,000 feet. Davis (2000) also states that the fault has not displaced in the last 14 million years, and certainly not in the last 3 to 4 million years. A major, near vicinity earthquake could possibly cause minor movement (probably < 1.0ft) at depth within the storage zone, but such offset is unlikely to propagate to within several hundred feet of the surface.

Post-1933 earthquakes within the Newport-Inglewood zone reportedly have damaged wells and well casings (Toppozada et al, 1988). The 21 October 1941, M 4.9 earthquake damaged wells at a depth of 5,000 to 6,000 feet in the West Dominguez oil field. On 18 June 1944, two smaller earthquakes in the Dominguez Hills reportedly damaged oil wells at depths of 3,000 to 6,000 feet. A small earthquake (M 2.7) apparently sheared oil well casing at 1,550 feet on 14 December 1947. Similar, though less significant, damages occurred due to low magnitude events in 1949, 1951, and 1955. Deep compaction of substrata in the Wilmington field may have caused these latter four occurrences.

Earthquake Ground Shaking

Estimated peak horizontal ground acceleration (PHGA) generated by earthquakes on the San Andreas Fault, Newport-Inglewood, and Elysian Park Thrust Fault should range from about 0.1 g to 0.7g. These earthquakes would generate enough energy and spectral content, and have a sufficiently long duration, to damage project facilities, adjacent structures, and area residences.

Induced Seismicity

Microseismic activity, with magnitude –1.0 to 1.0 Mw, often occurs during injection and extraction operations (Terralog Technologies, 2000). Activity of this magnitude can be anticipated at PDR during operations, and is not significant relative to natural daily seismicity in the Los Angeles area. Earthquakes in this magnitude range would not cause subsurface fault movement of more than an inch and would not be felt at the surface.

Slope Stability

The MDR area is along the coastline north of the Bluffs. No slope stability problems are expected in this area since it is nearly flat. Five lots in the PDR area have steep slope angles, with slope heights of more than 50 feet in Quaternary marine terrace deposits. Although these slopes could fail under static or seismically-induced movement, there is little potential for slope stability problems due to the distances of the lots from the slopes and the massive nature of the deposits. Any unstable slopes that may be present locally could experience problems with or without proposed project construction.

Subsidence

Removal of oil and gas (or other fluids) from poorly consolidated geologic formations can cause surface subsidence. These fluid withdrawal processes can leave void spaces at depth. Unless refilled with fluids by re-pressurization techniques, poorly consolidated sediments may collapse causing subsidence in the shallower earth layers. The same general process can occur when groundwater is withdrawn from unconsolidated aquifers. There is no indication that groundwater withdrawal is taking place in the proposed project area, therefore the potential for subsidence is low.

In October 2000, the City of Los Angeles, Department of Public Works (LADPW) evaluated surface elevation changes in the Playa Vista project area (City of Los Angeles, 2001). During the period from 1975 to 2000, the maximum surface subsidence observed on one location was 2.66 inches. This occurred at an elevation marker placed in the curb of Manchester Boulevard at the intersection of Hastings Avenue. LA DPW concluded that area surface subsidence identified during their evaluation was probably associated with settlement of curbs, sidewalks and gutters along major streets.

Although the oil storage zone is well-consolidated, complete withdrawal of all storage gas (including cushion gas) may cause minor surface subsidence. No specific studies for the PDR field indicate this level of subsidence. For the Montebello Field (with somewhat similar geology) studies estimate two inches of subsidence distributed over a broad area (Terralog Technologies, 2000). Since the field will remain in operation, measurable surface subsidence is not anticipated. Due to the minor amounts of subsidence, the potential damage to surface structures is low.

Liquefaction and Other Secondary Earthquake Effects

Seismic hazard zone maps outline areas that are considered susceptible to liquefaction and earthquake-induced landslides. Liquefaction susceptible areas are mapped within the MDR project area, but not within the PDR project area. Limited slope areas along the north bluffs of PDR are classified as potential landslide hazards but these areas do not impact planned sale lots.

REGULATORY SETTING

This section presents a discussion of regulations that address geologic hazards in California, applicable to the project site. In addition, with a long history of oil production in southern California, dating back to the late 1800s and early 1900s, the need existed for regulations to protect people and the environment from various potential impacts associated with oil and gas operations. Today, operators must comply with numerous safety and environmental laws, regulations and guidelines. Thus, the oil and gas industry, including the SCG gas storage facilities, is highly regulated. Government agencies and regulation issues relevant to this project are discussed below.

SEISMIC HAZARDS MAPPING ACT

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities,

counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design. The project site is located within a seismic hazard zone for landslides, as designated by the CGS.

CALIFORNIA DIVISION OF OIL, GAS AND GEOTHERMAL RESOURCES

The California Division of Oil, Gas and Geothermal Resources (DOGGR) regulates production of oil and gas, as well as geothermal resources, within the state of California. DOGGR regulations define well design and construction standards, surface production equipment and pipeline requirements, and well abandonment procedures and guidelines.

(1) DOGGR regulates well abandonment procedures to ensure they are conducted safely and are effective. These regulations require procedures designed to prevent future migration of oil and gas from a producing zone to shallower zones, and to protect groundwater.

(2) DOGGR oversees operations. When an operator ceases well operation or production, state law requires the well is abandoned within a reasonable period of time.

(3) Regulations require operators to maintain detailed records of abandonment operations and file copies with DOGGR

(4) DOGGR also regulates environmentally sensitive pipelines within 300 feet of any public recreational area, or a building intended for human occupancy (residences, schools, hospitals, and businesses) that is not necessary to the production operation

DOGGR regulations are defined in the California Code of Regulations (CCR), Title 14, Chapter 4.

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY (CAL EPA), DEPARTMENT OF TOXIC SUBSTANCE CONTROL (DTSC)

The California Department of Toxic Substance Control (DTSC) oversees the identification, cleanup and removal of hazardous or potentially hazardous materials that may be present on project parcels. DTSC oversight would include remediation of hazardous or potentially hazardous soil contamination caused by past oil field activities. Crude oil is exempt by DTSC, and therefore, is not regulated as a hazardous substance.

COUNTY OF LOS ANGELES, DEPARTMENT OF PUBLIC WORKS

For projects involving site grading and earthmoving, the County of Los Angeles, Department of Public Works (DPW), Building and Safety Division, has jurisdiction to ensure the safety of workers during construction and the public once the project is constructed. DPW, City of Los Angeles grading and earthmoving requirements are specified in the County Building Code (including the latest version of the Uniform Building Code) and the procedures outlined in the County Hydrology Manual.

CITY OF LOS ANGELES

The City of Los Angeles, Building and Safety Department, regulates design and construction of commercial and high occupancy structures located over areas with potential for gas reaching the surface. These areas typically include oil and gas resource areas (active and abandoned oil and gas fields), landfills and other areas where shallow subsurface gas has been documented.

The City of Los Angeles Fire Department prohibits construction of dwellings closer than 50 feet from an oil well. The Fire Commission may grant variances not exceeding 10 percent of the required clearances. Any substantial reduction in clearances should impose additional safeguards from fire and exposure to fire. Upon completion of well abandonment procedures, the Los Angeles Fire Department conducts a final inspection of the well site.

Along with the DPW, the City will issue permits for project related grading activities within the city, monitor project related construction activities if applicable, and ensure compliance with permit requirements. The City will issue final project approvals and a certificate of occupancy (if applicable) when they receive verification of compliance to inspections and requirements.

REPORTED ABANDONMENT PROCEDURES: DIVISION OF OIL, GAS AND GEOTHERMAL RESOURCES

The Division of Oil, Gas and Geothermal Resources (DOGGR) maintains well records and oversees well abandonment procedures. DOGGR (2001) provided information from their records for the wells listed in Table F-1. This information from DOGGR is presented in the following paragraphs.

- Well Number: 29-1 - Well plugged on 5/12/41 by Del Rey Realty Company. Reentered well on 5/21/56 by Southern Cal Gas Co. During reentry, well blew out through 7” @ 713’. 7” eventually cut @ 732’ and relanded new 7” from 732’ to surface. Pressure tested good with 1400 psi for 15 min. Well plugged on 8/4/94. No record of gas test.

- Well Number: Big Ben No. 1 - No mention in DOGGR record of casing repair @ 150 feet nor surface seep during 1991. Well plugged on 10/26/92. Gas test on 3/27/95 - OK.

- Well Number: Blackline No. 1 - Well was plugged on 3/4/37 by Black Line Oil Co. Reentered well on 1/31/57 by Southern Cal Gas Co. During reentry, located hole in 6 5/8” casing below 968’. Also, indication of leaking 4 3/4” casing downhole. The 6 5/8” casing cut and pulled from 1058’. Relanded new 6 5/8” casing from 1058’ to surface. Opened port collar and cemented. Top of cement estimated at 452’. Pressure tested with 2500 psi for 20 minutes - OK. On 12/22/81, notice to repair leak @ 1058’ and holes @ 1065’. Perforated 4 holes @ 1065’ and squeeze with cement. Tested to 600 psi for 30 minutes - OK.

- Well Number: SoCal No. 4 - On 12/9/75, located holes in 8 5/8” casing between 3258’ - 3396’. Bad casing interval cemented across. Pressure tested to 1000 psi for 20 minutes - OK. On 4/5/78, located holes in 8 5/8” casing between 3298’ - 3319’ and 2095’ - 2122’. Both bad spots cemented and pressure tested - OK.

- Well Number: SoCal No. 3 - Only evidence of problem was recorded on 3/16/87, when after running routine inspection and casing log, the tree didn’t hold pressure. “O” ring seals were replaced and everything OK.

- Well Number: 12-1 - On 10/22/75, located leak in 6 5/8" @ 175'. Cut and pull 6 5/8" casing from 481'. Ran 9 5/8" casing to 513' and cemented thru ports at 475 to surface. The 6 5/8" casing was relanded at 481' and pressure tested to 2000 psi for 20 minutes - OK.

- Well Number: 24-2 - On 4/30/75, well reported leaking from cellar thru 7". Found upper portion of 7" corroded. Cut and pulled 7" casing from 172'. Replaced with additional 7" to 172' and pressure tested to 2000 psi for 15 minutes - OK.

- Pomoc No. 1 - Notice to investigate casing and repair leak at 2830'. During inspection, upper part of 7" casing found to be tight. Cut and pulled from 657'. Did not find any holes. Replaced with new 7" casing to 657' and pressure tested to 3000 psi for 20 minutes. Ran casing patch from 2815' to 2845' and pressure tested to 2000 psi for 20 minutes - OK.

- Joyce No. 1 - Well plugged on 3/15/93. No gas test. No recorded leaks.

- Lo Mar No. 1 - Well plugged on 7/14/36 by Lor Mar Development Co. At time of plugged, well had bad 13 3/8" casing @ 572'. Reentered well on 3/15/56 by Southern Cal Gas Co. Cut and pulled 6 5/8" casing from 716'. Replaced with new 6 /58" casing and cemented through ports at 706' to surface, between 13 3/8" and 6 5/8" casings. Top job was required to bring cement to surface. Well plugged on 12/1/92. No gas test.

APPENDIX F

HAZARDS AND HAZARDOUS MATERIALS BACKGROUND INFORMATION

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HAZARDS AND HAZARDOUS MATERIALS BACKGROUND INFORMATION

ENVIRONMENTAL SETTING

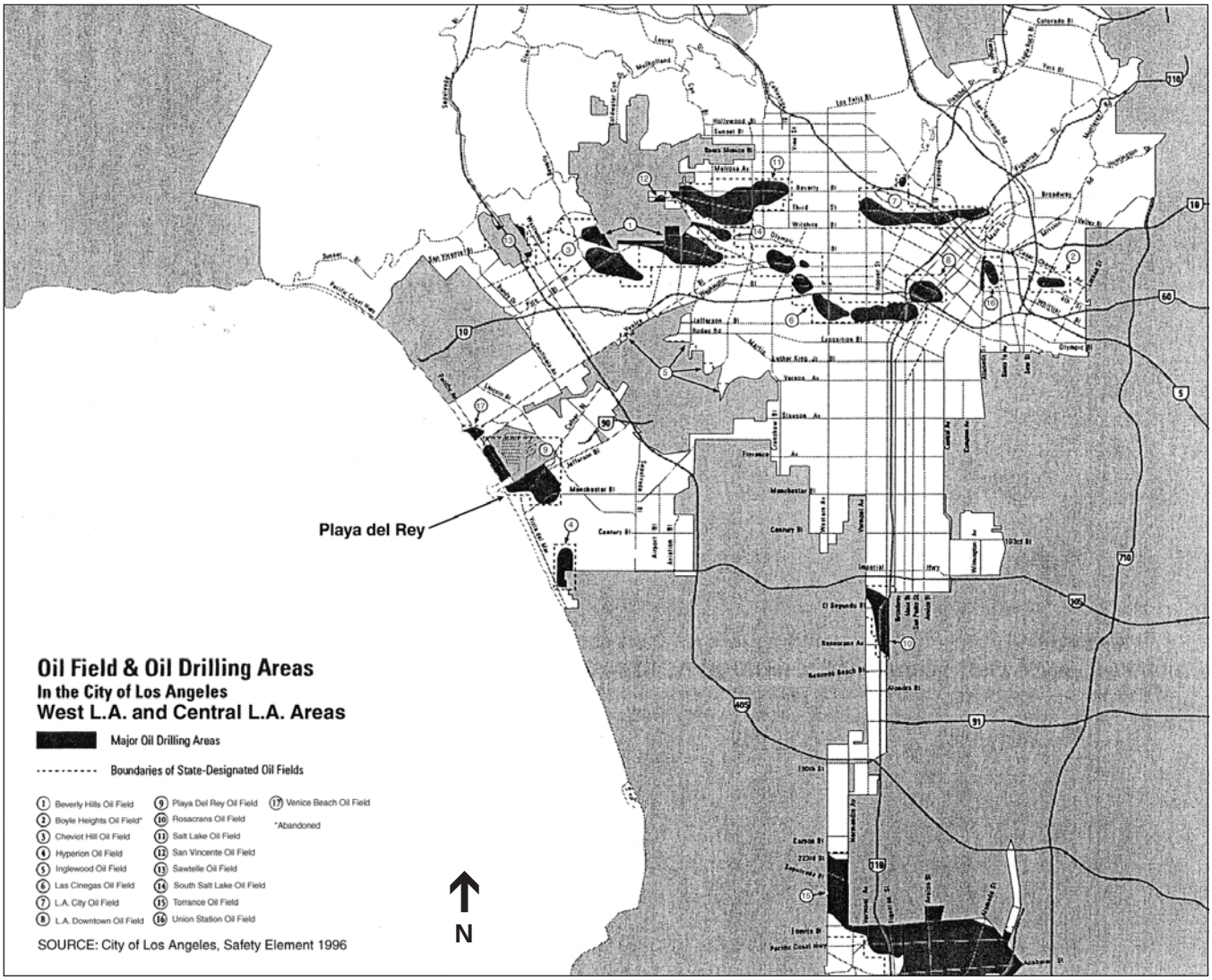
As discussed in Section VII, Geology and Soils, the project area overlies a region of oil fields as shown on Figure F-1. In the early twentieth century oil was extracted from this region and in 1942, the Southern California Gas Company (SCG) converted the depleted Playa del Rey oil field into a natural gas storage reservoir; one of five gas storage facilities operated and maintained by SCG in the Los Angeles region, within a 40 mile radius of the project area. These facilities are capable of meeting all current and anticipated SCG future needs for the Los Angeles region. Therefore, the regional value of gas storage has declined in accordance with increasing available supply of storage and available transmission capacity to serve the regional demands.

There are no designated quarry areas either on the project lots or in the vicinity of the project lots.

REGULATORY SETTING

The current regulatory framework relevant to hazards and human health encompasses process risk related to the use of hazardous materials and management of risks from hazardous materials that have been released to the environment. With respect to chemical hazards, the use, storage, and disposal of hazardous materials and wastes are regulated through a network of overlapping federal, state, and local laws and regulations. Various government agencies are responsible for implementing these laws and enforcing their requirements.

Federal and state laws require planning to ensure that hazardous materials are properly used, stored, and disposed of, and in the event that such materials are accidentally released, to prevent or to reduce injuries to human health, safety, or the environment. Businesses must store hazardous materials appropriately and train employees to manage them safely. Hazardous waste laws impose cradle-to-grave liability, requiring generators of hazardous wastes to handle them in a manner that protects human health and the environment to the extent possible. Both federal and state laws have established programs to identify hazardous waste sites, to require site remediation, and to recover the costs of site remediation from polluters. The following discussion briefly summarizes regulations that must be complied with regardless of ownership of the generating station.



SOURCE: City of Los Angeles, Safety Element 1996

Figure F-1

Oil Fields in the West and Central Los Angeles Areas

FEDERAL

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA)

Commonly known as Superfund, this federal law defines reportable quantities for spilled materials and the process for investigation and cleanup of contaminated sites The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) also establishes a National Priorities List and outlines a liability and response mechanism for releases of oil and hazardous materials.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) OF 1986

This law establishes public reporting of the use of certain chemicals under Title III, also known as the Emergency Planning and Community Right-to-Know Act. In California, some of the provisions of the Superfund Amendments and Reauthorization Act (SARA) Title III are implemented locally by the city or county health department through the Business Plan and hazardous material inventory requirements.

CLEAN WATER ACT (CWA)

The CWA sets up the framework through which permits to discharge waste to surface waters are authorized. The National Pollutant Discharge Elimination System (NPDES) permit typically has conditions specific to the permitted operation and may set limits on acidity (pH), chemical concentrations, oil and grease, dissolved and suspended solids, and temperature of the discharge. The CWA also prohibits the discharge of pollutants to storm water.

OIL POLLUTION ACT OF 1990 (OPA)

The Oil Pollution Act (OPA) regulations supplement existing laws regarding the storage and handling of oil. As defined in OPA, Spill Prevention Countermeasure and Control (SPCC) Plans are required for facilities storing bulk oil. OPA also added requirements for facilities presenting a threat to navigable waters, including preparation of an Facility Response Plan (FRP) that prepares a facility for response to potential worst-case spills. OPA includes employee training requirements related to prevention of, and responses to releases.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

The Occupational Safety and Health Administration (OSHA) regulations contained in Title 29 and the Cal-OSHA regulations codified in Title 8 contain employee safety provisions that attempt to minimize the hazards for employees in the workplace.

TOXIC SUBSTANCES CONTROL ACT (TSCA)

The Toxic Substances Control Act (TSCA) includes requirements for the storage, use, and disposal of Polychlorinated Biphenyls (PCB)-containing materials.

DEPARTMENT OF TRANSPORTATION (DOT)

Physical hazards, storage field maintenance and operations defined by the Department of Oil Gas and Geothermal Resources (DOGGR) are under the federal jurisdiction of the Department of Transportation (DOT). The DOT regulates the transportation of hazardous materials between states. Both federal and state agencies specify driver training requirements, load labeling procedures, and container specifications. The DOT also indirectly regulates the transportation of natural gas through pipelines according to the Natural Gas Pipeline Safety Act. The Act requirements, including designing pipelines to maximize safety (e.g., installing corrosion protection), routinely inspecting pipelines, preparing for possible emergencies, and reporting injuries and physical damage caused by accident, have been adopted by the California Public Utilities Commission (CPUC).

STATE

Title 22 of the California Code of Regulations defines, categorizes, and lists hazardous materials and wastes. Title 22 defines a hazardous material as:

> "a substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (2) pose a substantial present of potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed."

Hazardous wastes are categorized in Title 22 as either hazardous wastes, as defined in the Resource Conservation and Recovery Act (RCRA) or non-RCRA hazardous wastes. Title 22 lists chemical compounds that are presumed to make a material or waste hazardous to the environment.

CALIFORNIA WATER CODE (CWC)

The California Water Code (CWC) includes provisions of the federal CWA and water quality programs specific to California. The CWC requires reporting, investigation, and cleanup of hazardous material releases that could affect waters of the state (including storm waters).

CALIFORNIA ABOVEGROUND PETROLEUM STORAGE ACT

The California Aboveground Petroleum Storage Act, which is implemented by the Regional Water Quality Control Boards (RWQCBs), regulates the storage of petroleum in aboveground storage tanks (ASTs) and requires construction methods and monitoring to prevent petroleum releases.

CALIFORNIA HEALTH AND SAFETY CODE SECTION 25534 (CAH&SC)

Section 25534 of the California Health and Safety Code (CAH&SC) requires businesses that handle amounts of Acutely Hazardous Materials (AHMs) in excess of certain quantities to develop a Risk Management Plan (RMP). The RMP encompasses process hazards, potential consequences of releases, and documentation, auditing, and training relative to the AHMs that are above specified threshold

quantities at the generating station. Regulated AHMs may include aqueous ammonia and sulfuric acid, as well as other acutely hazardous substances.

CALIFORNIA DEPARTMENT OF CONSERVATION, DIVISION OF OIL, GAS AND GEOTHERMAL RESOURCES (DOGGR) AND CPUC

Physical hazards, storage field maintenance and operations within the Playa del Rey gas storage facility are under the jurisdiction of the California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) and the California Public Utilities Commission (CPUC). DOGGR regulates the operations and maintenance of natural gas storage fields, and certain aboveground piping is regulated by the CPUC. DOGGR manages oil and gas resources in California and for the Playa del Rey field. The City of Los Angeles has local responsibility and authority through land use permitting and zoning for both oil and gas production and quarry and mining operations. The City also has zoning jurisdiction through special use permits and overlays for oil and gas. Currently, SCG holds use permits and lands are currently zoned for residential (35 of the 36 lots) and commercial (1 of the 36 lots).Playa del Rey Gas Storage Facility (PDRGSF)

The Storage Field is regulated by a number of state and local agencies. The DOGGR has primary jurisdiction over gas storage operations. The storage field operates pursuant to a permit issued by DOGGR, which requires, among many other things, extensive reporting, inspections, and performance reviews. Oil production has been exercised in the Los Angeles area for over seventy years. Gas production has been exercised for over sixty years. Federal and state regulations have been established to manage current and abandoned operations. There are significant numbers of abandoned oil and gas wells throughout the Los Angeles basin. Several of these abandoned wells have buildings constructed over or adjacent to them, and their proximity may be concern for the potential for exposure to hazards if there is gas leakage from abandoned wells. The Playa del Rey Gas Storage Facility (PDRGSF) is the only operating gas storage facility left in the Los Angeles Basin.

A DOGGR Project Approval Letter defines requirements that are specific to the Playa del Rey storage field (1986). Environmental conditions and well safety equipment are inspected regularly. During these inspections, a DOGGR inspector looks for indications of any type of oil or gas leaks from wells, pipelines, pressure vessels, and tanks. They also witness testing of the automatic shut down equipment on each well. Storage project performance reviews take place annually. During these reviews, DOGGR engineers examine SCG records to ensure that all well and reservoir monitoring and leak survey requirements were met.

Storage Tanks

Hazardous materials are typically stored in underground or aboveground storage tanks. Laws and regulations regarding underground storage tanks that are used to store hazardous materials (including petroleum products) require that owners and operators register, install, monitor, and remove their tanks according to established standards and procedures. Releases are to be reported. Owners of above-ground storage tanks containing petroleum products are required to prepare and implement spill prevention and response strategies, and to contribute to the Environmental Protection Trust Fund that is used to respond

to some spills. Proper drainage, dikes, and walls are required in order to prevent accidental discharges from endangering employees, facilities, or the environment.

Well Abandonment Regulations and Policies

DOGGR has adopted regulations[13] for well abandonment to ensure that it is done safely and effectively. These regulations provide well abandonment procedures that prevent future migration of oil or gas from the producing zone and the upper zones, as well as protect groundwater. Furthermore, the DOGGR is charged with ensuring that public safety is not endangered. The DOGGR has the expertise and the authority to require whatever steps are deemed necessary to protect public safety, up to and including requiring SCG to cease operations and/or remove all gas from the field. They have approved SCG operations and monitoring program. As stated above, well abandonment is discussed in more detail within the geology section of this document.

After subsurface abandonment is completed and the surface portions of the well are removed, SCG must test and remove soil that has been contaminated by oil or other well maintenance substances. At the end of abandonment operations, the DOGGR and the Los Angeles Fire Department will complete a final inspection of the well site. After this inspection, the DOGGR will review all of the abandonment records of the operator and will either provide a final abandonment approval or a notice of deficiency that must be corrected.

Regulations Regarding Construction of Buildings Over Abandoned Wells

Future development of the lots would be subject to the requirements of local permitting agencies and would include compliance with all requirements for construction over abandoned wells. The regulatory requirements for building over abandoned wells are discussed in the Geology Section of this document (Section VII).

Other local agencies that have jurisdiction over the PDRGSF facilities or operations include the Los Angeles Fire Department, the South Coast Air Quality Management District, the Los Angeles County Sanitation District, and the Occupational Safety and Health Administration.

GAS MIGRATION

Well Drilling in the Playa del Rey Oil Field and Natural Gas Storage Field

Drilling in the region began as early as 1921 (Davis, 2000b). Early holes drilled and abandoned in the area during 1925 and 1926 were not deep enough to reach the producing zones in the Schist Conglomerate. The discovery well for the Playa del Rey (PDR) oil field was completed in 1929. Primary field development continued through the mid-1930s. By the early 1940s production had reached its economic limit and operators abandoned oil production from the field.

In 1942, as part of the national war effort, the federal government condemned and took possession of approximately 240 acres of the PDR field area to use as a natural gas storage field. This gas storage field

[13] These regulations can be found in California Code of Regulations, Title 14, Chapter 4.

was later transferred to the Reconstruction Finance Corporation in 1945. Then, in 1953, the Reconstruction Finance Corporation declared the field surplus and offered it for sale in 1953. The Southern California Gas Company was the successful bidder and assumed operations in late 1953.

Facilities were completed in 1956, and then gas was injected and stored at depths of about 6,200 feet within the Conglomerate Trap Zone. By July 1958, approximately 27 billion cubic feet (bcf) of cushion gas was stored. Since that time, numerous wells have been utilized for storage and retrieval of the gas. Currently, the storage field is operated through 54 wells directionally drilled from the lowlands and hilltop of PDR. Of these 54 wells, 25 are injection/withdrawal wells used to inject and extract gas, 8 are liquid (primarily water) removal wells, 3 are lateral migration wells to control gas movement, and 18 are observation wells used to monitor pressure and liquid saturation. SCG's facility for the PDRGSF is 0.2 mile north of Manchester Avenue.

Types of Gases

The three types of gas that may exist within the geological and soil units underlying the project area are processed natural gas (or piped gas), biogenic (or swamp) gas, and thermogenic (field) gas. Biogenic gas is primarily methane with carbon dioxide and sulfide gases resulting from decomposition of organic material in former lagoon deposits or other sources. Thermogenic gas is generated at depth, when increased temperatures and pressures alter organic material. It includes a broad range of gas components (methane, propane, butane, ethane, etc.). In contrast, processed natural gas is primarily methane remaining from thermogenic gas after most of the heavier gas components are removed (usually less than 0.1% heavy thermogenic hydrocarbons). These gas types exhibit distinct chemical characteristics, which permits "finger-printing" of gases or differentiation between gas types. In addition to lacking heavier gas components (propane, butane, ethane, etc.), the presence of helium in detectible amounts is a primary fingerprint for natural gas imported from the central US and previously stored in the deep storage zone.

Natural gas can occur in subsurface environments as various phases. Understanding gas phases is important because each phase exhibits specific physical properties, and thus posses different flow characteristics. These phases include free gas, liquefied petroleum gas, and dissolved gas in both water and oil depending on pressures and temperatures. When evaluating the potential for shallow gases reaching the surface, the primary phases of concern are free gas and dissolved gas in groundwater.

Migration Pathways

Studies have detected natural gas at the surface in the PDR area, as well as areas overlying other oil fields. Surface gases can originate from biogenic, thermogenic, or storage sources, or a combination of these sources. Gas reaches the surface through various natural, man-made, or combination migration pathways.

Both biogenic and thermogenic gas were detected by ETI (2000) during a soil gas survey in the Playa Vista area. Following a second phase of evaluation ETI (2001) concluded, "storage gases are not present in any of the methane anomalies observed east of Lincoln Blvd." Routine surface monitoring SCG wells found storage gases were reaching the surface through casing leaks and along the well casings in three

wells. Biogenic gas was detected in four abandoned wells in the PDR field area, resulting in re-abandonment of these wells to eliminate the leaks.

Major Pathways

Man-made structures can convey gas to the surface from deep or shallow sources. A list of the most common man-made structures that could serve as vertical conduits include:

- Old abandoned oil and gas wells or dry holes, (abandoned prior to current DOGGR regulations
- Previously undocumented wells and dry holes
- Existing water extraction or injection wells
- Old abandoned water wells
- Monitoring wells
- Recently plugged and abandoned oil and gas wells (abandoned in accordance with current DOGGR regulations)

Gas can also reach the surface through natural geologic features, which may facilitate vertical, lateral, or oblique migration. The geologic features most likely to serve as potential pathways include:

- Surficial deposits
- Porous and permeable formations
- Aquifers
- Fracture systems
- Fault planes
- Other geologic features and structures, such as unconformities

The potential gas migration reaching the surface is considered greatest through or along man-made structures. In general, geologic pathways are relatively “tight” in the “shallow” and storage zones. Fractures, faults, and spaces between individual grains are minimized due to the tremendous overburden pressure (the weight of the rock materials). Within the Project area, wells penetrate shallow and deep gas zones at various depths. Once penetrated, a poorly constructed or abandoned well can serve as a conduit for upward migration of natural gas. Such conduits can develop as old wells deteriorate (over the 70 years), even when proper construction and abandonment methods have been applied.

Natural gas of biogenic, thermogenic, and storage sources can travel through a variety of man-made structures to migrate both vertically and laterally through the subsurface. In addition to oil and gas wells, both active and abandoned water wells can serve as vertical conduits, especially in the upper 1,000 feet of geological section. Utility trenches, storm drain systems and sewer lines provide lateral migration pathways, accumulation areas, and near-surface openings for natural gas release.

Natural Pathways

Various studies prepared by SCG, DOGGR, US Geological Survey (USGS), and California Geological Survey (CGS) suggest faults in the PDRGSF area . The USGS and CGS publish maps showing documented faults and reports describing such faults. No through-going active surface faults have been documented by either the USGS or CDMG. None of the information or reports reviewed for this study present conclusive evidence of active surface faults in the immediate project vicinity. The Compton

Blind Thrust Fault passes beneath the project site at much greater depths (>20,000ft), but no related fault is yet known to cut through the storage zone.

The Charnock fault is considered potentially active, and crosses the northeastern edge of the PDRGSF. Smaller, shorter faults and fracture systems are inferred in various units of the storage zone within the PDR field, but are not likely to transmit large volumes of crude oil or natural gas during short time intervals (days, weeks, or months). Naturally occurring subsurface migration of petroleum hydrocarbons typically takes place over extended periods of time, possibly tens or hundreds of thousands of years or more. Natural transmission of hydrocarbons through these systems is known within the oil and gas industry as "micro seeps." Upward migration of oil and gas through micro-seeps allowed hydrocarbon emplacement in shallow zones. Significant natural upward migration from the storage zone is unlikely during the productive life of the PDR field.

The original reservoir pressure in PDR field was 2,750 psi, which is within the range of normal pressure gradient for the storage zone depths (Davis, 2000). Operating pressures (maximum 1,700 psi) are about 38 percent lower than original reservoir pressures. Therefore, significant volumes of storage gas would not be expected to migrate to the surface through natural geologic features.

Past and proposed withdrawal of gas from the storage zone is not expected to cause downward movement of groundwater or other fluids from shallow zones. With decreased reservoir pressures, lithostatic forces (rock overburden pressures) become more dominant, further sealing (through compaction) any open fractures or void spaces in the cap rock. Thus, the potential for fluid or gas migration through geologic pathways either into or out of the storage zone is low.

Shallow gas may migrate through younger earth materials to reach the surface. Both Pleistocene and Holocene sedimentary deposits include many permeable horizons or zones. Both biogenic and thermogenic gas from shallow zones can migrate, both vertically and laterally, through these permeable layers. Gas migration would involve both free-phase and dissolved-phase gases (dissolved in water). In the Playa Vista area immediately northeast of the project site, the contact between the San Pedro Formation and overlying younger alluvium form a contact between geologic units that could affect both lateral and vertical subsurface fluid or gas movement.

Faults affecting the project vicinity are discussed above under Structure and Seismicity. Based on his review of geologic reports and well records for PDR field, Davis (2000b) concludes that there is no evidence for faults cutting through the primary or secondary seals, and there is no evidence of through going fracturing of the seal. In the project area, the northwest-southeast trending Charnock fault (potentially active) is the closest documented fault in the vicinity. It crosses through the area east of the PDRGSF and project site. Although it is possible that undocumented faults could exist and contribute to upward gas migration, rates would not be significant compared to leaking wells.

During well drilling, fractured zones were encountered in some boreholes. The type (open, closed, sealed) and extent of fracturing were not determined from the information available. This fracturing could be related to minor faulting in the immediate vicinity. Minor faults could affect subsurface gas migration, by either acting as barriers to lateral movement or pathways for vertical migration. Gas movement rates associated with minor faulting would not be significant compared to leaking wells.

The presence of shallow high-pressure gas zones encountered in the Playa Vista area indicates confinement of upward hydrocarbon migration from these intervals. At these locations, shale intervals within the Pico and Repetto Formation form effective cap rock or seals. If natural upward migration pathways were present, such as open fracture systems, gas in these shallow zones would exhibit a normal pressure gradient. High pressure was not released until these zones were penetrated during well drilling operations.

Leaking Wells

Several factors contribute to possible gas migrations through abandoned and active wells such as original drilling, development and completion, operations and redevelopment, and abandonment. Many wells and dry holes were drilled during the exploration and early field development period. Dry or non-commercial wells were abandoned. Common practice by some operators in the 1920s through 1940s was to abandon wells and dry holes by filling them with construction debris or other items, such as telephone poles or railroad ties, prior to covering the surface with soil. These improperly abandoned wells have been unearthed during grading operations for construction sites located over old oil field in several areas of the Los Angeles Basin. Many of these wells and dry holes may not have been plugged to modern standards. Current abandonment requirements have developed since the 1950s to the more stringent standards today. Old dry holes and noncommercial wells have a high potential to provide migrations pathways.

Early in the history of oil and gas development in California and the United States, noncommercial or dry holes were drilled and abandoned without proper documentation and reporting, and some of these abandoned dry holes and wells may not have been recorded by the original drillers or DOGGR. Absence of unknown abandoned holes cannot be determined with certainty. Should they exist, they could serve as migration pathways.

Well construction, redevelopment, and abandonment deficiencies can contribute to gas migration problems. If cement bonds between the casing and surrounding natural formation do not form adequate storage seals, pressurized leakage is possible. Leakage through the annular space between casing and formation can occur under the following circumstances: lack of proper seals, inadequate seal or poor cement bonds with bore walls, channels within cement, deterioration of annular seals over time, and fracturing or cavitation of enclosing walls.

When present, shallow high-pressure gas zones can create problems for cement annular seals. During the well completion process, cement slurry is pumped into the annular space between the hole drilled (rock face) and casing to form a seal. Gas from shallow high-pressure zones can enter cement within the annular space during this process. Gas bubbles within the slurry weakens the cement and can compromise seals around these zones. In turn, poor seals could allow fluid migrations and enhance corrosion of both casing and cement in these areas. If large volumes of gas enter the annular space, vertical channels within the cement seal can also form. Marlow (1989) discusses the mechanisms contributing to compromised integrity of annular cement seals associated with gas zones.

Structural integrity of well components and seals is not permanent. Over extended periods of time, they eventually deteriorate. Both casings and seals are subject to corrosion caused by exposure to chemical attack, high and fluctuating pressures, high temperatures, and earthquakes. Steel casing is susceptible to

rusting from saline and sour/sulfurous water produced along with the oil. Hydrogen sulfide of sour water and sour gas can corrode both steel and cement. Differential earth stresses (e.g., local earthquakes) can affect well integrity, even causing casing to collapse. Any deterioration of well integrity can lead to leaks.

Abandoned Wells

During past routine SCG surveys of abandoned wells, SCG determined that three previously abandoned wells on the Marina del Rey Peninsula (not part of the proposed project) would be re-abandoned following detection of leaking natural gas. Well designations and locations for these wells were not provided for this study. Although the origin of detected gas was biogenic and not the storage zone, SCG assumed responsibility and re-abandoned these wells to seal the leaks.

A leak was recently discovered in a well in the MDR area designated as Block No. 11 (while this well is not part of this proposed sale of property, it is in the vicinity of Cluster 12). This well was abandoned in April 1993 and sold with the surface parcel in 1997. The leak was discovered when DOGGR reviewed and tested the well prior to construction on the site. Preliminary analyses indicate that gas may be biogenic. Based on information available for this review, gas detected in this well is probably not emanating from the PDR storage facility. SCG will assume responsibility and re-abandon this well prior to site construction.

In the Playa Vista area east of the proposed project site, ETI (2000) conducted a soil gas survey. Several gas anomalies were identified during this survey. Analyses of samples collected indicates a combination of both biogenic and thermogenic gas origins. The presence or absence of storage gas was not confirmed during this study.

An examination of DOGGR maps showing locations of abandoned wells in the gas study area indicates that at least two of these soil gas anomalies correspond with locations of old abandoned wells or dry holes (Universal City Syndicate, Inc. Vidor No. 1 and Cooperative Development Co. Community No. 1). ETI (2000) indicates that a shallow dry hole (A.L. Kitselman, Del Rey No. 1) was also present in an area with surface gas anomalies. These old wells or dry holes may not be abandoned in accordance with current DOGGR regulations. In addition, the two deep abandoned holes penetrated shallow high-pressure gas zones during drilling. As such, they could provide vertical conduits through which thermogenic gas from shallow zones could reach the surface.

Reported Leaking Wells: Southern California Gas

A review of limited Southern California Gas Company records indicates past leaks and surface seepage documented in ten wells located in the Del Rey Hills areas. Following repairs in the ten identified wells, four of these wells experienced recurrences or new leaks. These wells and information on their respective leaks are summarized in Table F-1. Data provided for review was limited; therefore, this list of documented leaks may not be comprehensive.

- Based on the data provided, three leaking wells were discovered following detection of soil gas seepage. During routine field monitoring, near surface gas was identified around three wells: Well

No. 12-1 (1974), Well No. 24-2 (1975) and Big Ben No. 1 (1991). Leaks in Wells No. 12-1 and 24-2 were repaired, while Big Ben No. 1 was plugged and abandoned in 1991.

- Of the ten wells with documented leaks, three of them are included in the subject project: Well No. 29-1 (1959), Lor Mar No.1 (1981) and Joyce No.1 (1987). Casing leaks in each respective well were repaired. These three wells are on parcels (lots) subject to sale following approval of the proposed project. The Lor Mar No. 1, Joyce No. 1 and Well No. 29-1 were plugged and abandoned in 1992, 1993 and 1994, respectively.

- The ten wells are located between 1/2 mile and 1 mile south to southwest of the Universal City Syndicate Inc. Vidor No. 1. The Vidor No. 1, an old abandoned well, experienced a "blow-out" when shallow gas was encountered during drilling at depths from 1,140 to 1,150 feet. Multiple shallow gas zones were penetrated by this well. At least 4 other wells drilled in the Vidor No. 1 vicinity also penetrated various shallow gas zones at depths ranging from 510 to 3,434 feet.

Leaks in several of the ten wells listed occurred at similar depths to where shallow gas was encountered in old wells experiencing "blow-outs". These old wells were located immediately east and northeast of the subject project. Insufficient data was provided to correlate documented leaks with shallow gas zones.

Gas Responsibility and Rights

SCG owns most, if not all mineral rights in the PDR field and storage zone. As such, SCG is responsible for any gas leaks originating the PDRGSF area of influence and from thermogenic sources. Due to the nature of recent alluvial deposits, the generation of natural biogenic gas at the project site is likely. Biogenic gas in the area is probably related to decomposition of organic material deposited within a lagoon environment. In addition, some biogenic gas could also result from alteration of other hydrocarbons, including thermogenic gas, crude oil, or spilled materials. SCG is not responsible for occurrences of biogenic gas at the project site.

TABLE F-1
SUMMARY OF DETECTED GAS LEAK

Well Name	Problem	Depth (ft bgs)	Year Detected	Well Location
Well No. 29-1	Stage collar leak	723	1959	Between Falmouth Ave. & Calabar Ave., south of intersection with Cabora Dr.
Big Ben No. 1	Casing leak	150	1964	Between 79th St. & Veraqua Dr., northeast Zayenta Dr.
	Surface seepage		1991	
Blackline No. 1	Casing leak	1,064	1969	South of Cabora Dr., west of Veraqua Dr. and Zayenta Dr. intersection
	Casing leak	1,060	1986	
SoCal No. 4	Casing leak	3,216	1971	NW of Cabora Dr., about 1,000 ft. NE of intersection with Falmouth Ave. [a]
SoCal No. 3	Casing leak	3,300	1972	NW of Cabora Dr., about 1,000 ft. NE of intersection with Falmouth Ave.[a]
	Casing leak	3,300	1975	
	Casing leak	2,109	1977	
Well No. 12-1	Surface seepage	481	1974	Southeast of 81st St., north of intersection with 83rd St.
	Casing leak	210	1979	
Well No. 24-2	Surface seepage	191	1975	Northwest of 79th St., west of Zayanta Dr.
Pomoc No. 1	Casing leak	2,815	1975	West of Zayanta Dr., between 79th St and Cabora Dr.
Joyce No. 1	Casing leak	750	1987	Northwest of 82nd St., east of Saran Dr.
Lor Mar No. 1	Casing leak	720	1981	South of 83rd St., east of Saran Dr.

[a] Surface location of directionally drilled well. Bottom hole locations were not made available.

SOURCE: (DOGGR, various dates)

APPENDIX G

HYDROLOGY AND WATER QUALITY BACKGROUND INFORMATION

APPENDIX G

HYDROLOGY AND WATER QUALITY BACKGROUND INFORMATION

ENVIRONMENTAL SETTING

REGIONAL SETTING

Ballona Creek is a concrete-lined channel that conveys urban runoff and storm water runoff from a 78,000-acre watershed consisting of heavily urbanized Los Angeles, Culver City and Beverly Hills, the north slope of the Baldwin Hills, and portions of the Santa Monica Mountains to the north. The eastern extent of the watershed reaches I-110 near downtown. Much of the storm water falling on the city is collected in street drain inlets and conveyed in large underground sewers westward to the concrete-lined Ballona Channel. The channel empties into the Santa Monica Bay near the Marina del Rey marina and the Ballona Wetlands. As the channel nears the ocean, it becomes a tidally influenced estuary. Along the coast, storm water and urban runoff is conveyed directly to the beach through local sewers and drainage canals. The City and County of Los Angeles Department of Public Works are responsible for maintaining storm drains to minimize flooding within their jurisdiction. Flooding has been minimized through the construction of storm drains, flood control channels, detention basins, and pumping plants.

LOCAL SETTING

STORM DRAINAGE

The PDR lots sites are located on the Westchester Bluffs that drain northward on Falmouth Street to the Ballona Wetlands on the southern edge of the channelized Ballona Creek. No underground storm sewers exist in the streets within the project area. For both the PDR and MDR sites, storm water runoff is collected in gutters and transported off-site. The PDR lots drain to Manchester Avenue and then ultimately to the Ballona Wetlands along Falmouth Street. The MDR lots drain directly westward onto Venice Beach.

According to the City of Los Angeles Safety Element, the two lots located in MDR are within a 100-Year flood zone, directly on the beach at an elevation of less than 15 feet above mean sea level (amsl). The PDR properties are approximately 150 feet amsl and not within a flood zone.

GROUNDWATER

Regional ground water levels are at or near sea level (Chambers, August 2000). Shallow ground water in the vicinity of Playa del Rey has been degraded in the past from seawater intrusion as a result of over-

pumping of the central basin. However, water levels have subsequently risen in recent decades as extractions have been limited and seawater intrusion barriers have been implemented. The tidally influenced groundwater elevations within Playa del Rey vary from about two feet above to ten feet below mean sea level with flow to the northeast.

TSUNAMI

Tsunamis are extremely long-period waves often associated with underwater earthquakes. Other mechanisms such as volcanic activity or submarine landslides can also generate tsunamis. Due to its proximity to the Pacific Ocean and its low-lying elevations, the Marina del Rey area is subject to potential tsunami hazards. The maximum expected run-up of a tsunami wave in Venice Beach is approximately 9.6 feet in a 100-year time frame from a distant earthquake. Tsunamis generated from local earthquakes may be larger, but are less likely to occur. The two lots located in MDR would be subject to potential tsunami hazards.

REGULATORY SETTING

FEDERAL

The Clean Water Act (CWA) is administered by the United States Environmental Protection Agency (USEPA) to protect water quality. Section 402 of the CWA established the National Pollutant Discharge Elimination System (NPDES) to regulate discharges into waters of the US. The USEPA has delegated authority for implementing the NPDES program in the State of California to the State Water Resources Control Board (SWRCB), which in turn authorizes the Regional Water Quality Control Boards (RWQCB) to issue permits.

STATE STANDARDS

The RWQCBs have prepared Basin Plans, which identify beneficial uses and water quality objectives for each water resource in the state. The SWRCB requires that all discharges to waters of the US first obtain NPDES discharge permits. The NPDES permits include waste discharge requirements that establish water quality thresholds to maintain designated water quality objectives and beneficial uses. The NPDES permitting program includes storm water discharges for municipal storm sewer systems, industrial activities, and construction activities. To obtain coverage under the statewide general construction storm water discharge NPDES permit for a construction site greater than one acre, a project proponent must prepare a Storm Water Pollution Prevention Plan (SWPPP) outlining best management practices to be employed to avoid water quality impacts to local receiving waters.

In addition, pursuant to Section 303(d) of the CWA, the SWRCB has compiled a list of impaired water bodies in the state. The list includes Ballona Creek, Ballona Estuary, and the Ballona Creek Wetlands.

APPENDIX H

LAND USE BACKGROUND INFORMATION

APPENDIX H

LAND USE BACKGROUND INFORMATION

ENVIRONMENTAL SETTING

REGIONAL SETTING

The Southern California Gas (SCG) Playa del Rey Gas Storage Facility (PDRGSF) is located within Southern California within the City and County of Los Angeles. Thirty-four of the lots are located within the Playa del Rey (PDR) community, while two lots are located in the community of Marina del Rey (MDR). PDR is primarily a residential community with some commercial uses while MDR is a beach, harbor, and tourist-oriented community. PDR is located approximately 12 miles southwest of downtown Los Angeles and MDR is located northwest of Playa del Rey.

LOCAL SETTING

The main facilities of the PDRGSF are located at 8141 Gulana Avenue in the community of Playa del Rey, California. A complete list of the 12 wells on the PDR and MDR lots is included in Table 1 in the Project Description.

Thirty-four of the lots for sale are scattered throughout the PDR residential community. These 34 lots are not located in the coastal zone and are scattered throughout a long-established neighborhood located on top of a bluff overlooking the Ballona Wetlands and MDR (see Figure H-1). The lots are not located on the bluff's edge and most have no views. Thirty of the PDR lots are zoned for single-family residential development (R1-1); three of the lots are zoned multi-family residential (R3-1); and one of the lots is zoned for commercial development (CR-1).

Two of the lots for sale are located in a residential community on the Marina Peninsula approximately two miles north of the 34 lots in PDR. The two lots are located in a residential community on the Marina Peninsula in MDR. Both of the lots are zoned for multi-family residential (R3-1) development and are located within the coastal zone (see Figure H-2).

The sale of the lots has the reasonably foreseeable future action of infill structural development. SCG currently has four willing buyers, who would presumably develop the lots in accordance with their current zoning. Assuming the lots are developed in accordance with current zoning and surrounding land uses, development of 30 single-family residential homes, five apartment buildings, and one apartment building and/or commercial building would be constructed.

EXISTING LAND USE PATTERNS

The 36 lots are undeveloped in a highly developed existing community. With two exceptions, none of the lots are currently being used. In the past, SCG has permitted through written agreement the temporary use of two lots for landscaping. As part of the sales and subsequent purchase, the written agreements would be terminated and the landscaped areas would be reclaimed from the adjacent property owners. The remaining lots are private property and there is no evidence that these lots have been used with explicit permission from SCG. Therefore, the public has no reason to believe that the properties are available for public use.

All of the residentially zoned lots are surrounded by residential uses such as single-family detached dwellings. The commercially zoned lot is surrounded by multi-family residential uses and commercial uses.

REGULATORY SETTING

The main tools used in land use regulation are planning documents, ordinances, and permitting procedures, as employed by local agencies. The general plan assembles the local jurisdiction's basic land use doctrine and regulates future land use decisions. The zoning ordinance governs the type and intensity of land uses and sets standards for development within a city or county. The following outlines the general plans and zoning ordinances that govern the facility property and surrounding lands.

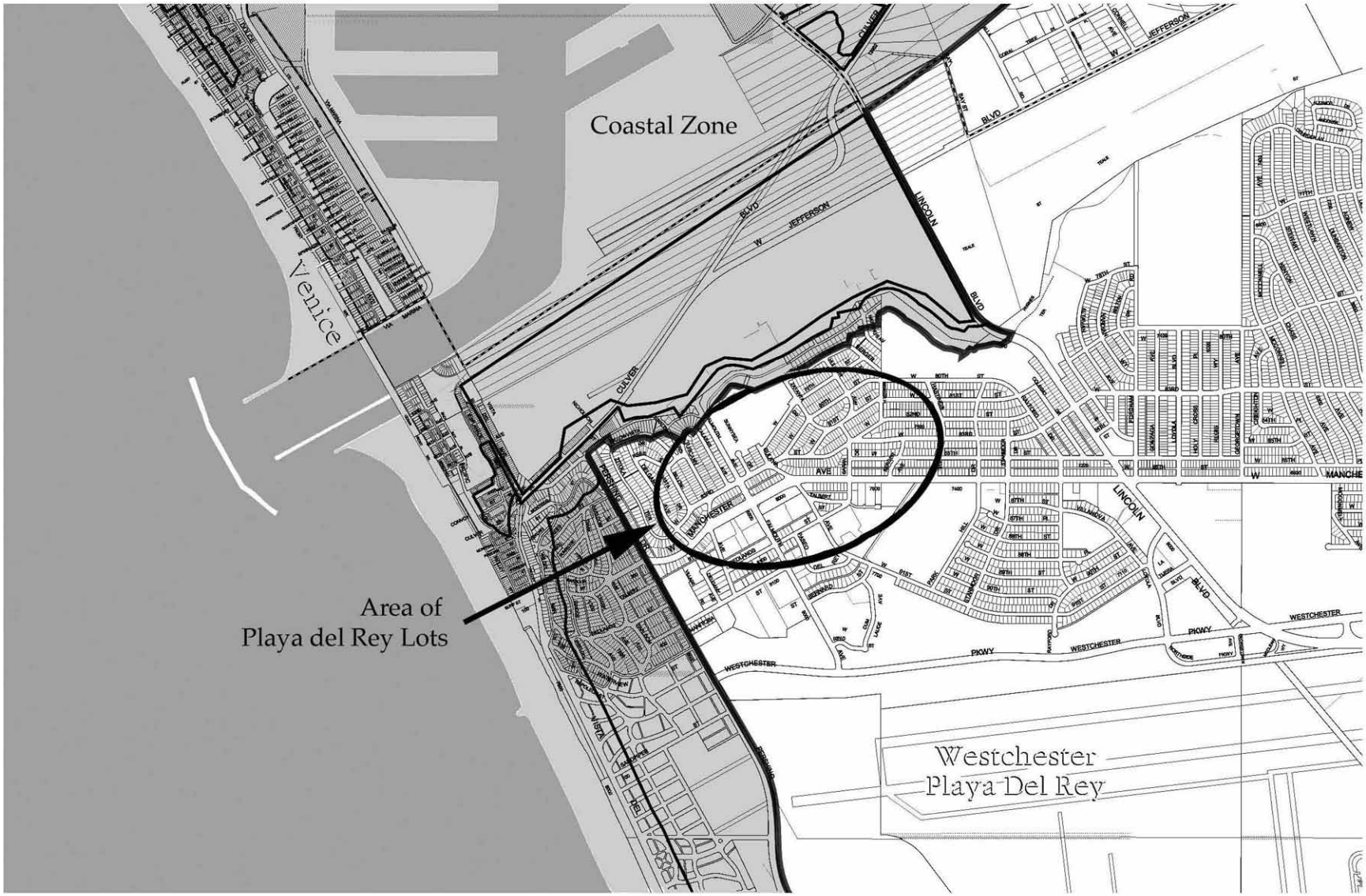
GENERAL PLAN AND ZONING ORDINANCE

PDR and MDR are communities within the City and County of Los Angeles, represented by a City Council. PDR falls under the jurisdiction of the Westside Planning Area of the County of Los Angeles *General Plan* (see Figure H-1) and the Southwest sub-region of the City of Los Angeles *General Plan* (see Figure H-2). The two communities fall within the Westchester-Playa del Rey Community Plan and the Venice Community Plan under the Land Use element of the City of Los Angeles *General Plan*.

WESTCHESTER-PLAYA DEL REY DISTRICT PLAN

The Westchester-Playa del Rey District Plan (Westchester Plan) identifies the 34 lots located in PDR as within the Westchester-Playa Del Rey Community Plan Area (CPA) of the City of Los Angeles. The Westchester Plan is designed to accommodate the anticipated growth in population and employment of the District to the year 2000 (Los Angeles, 1974). The CPA is covered by the following Specific Plans: the Coastal Transportation Corridor Specific Plan; the Coastal Bluffs Specific Plan; and the Playa Vista Specific Plan.

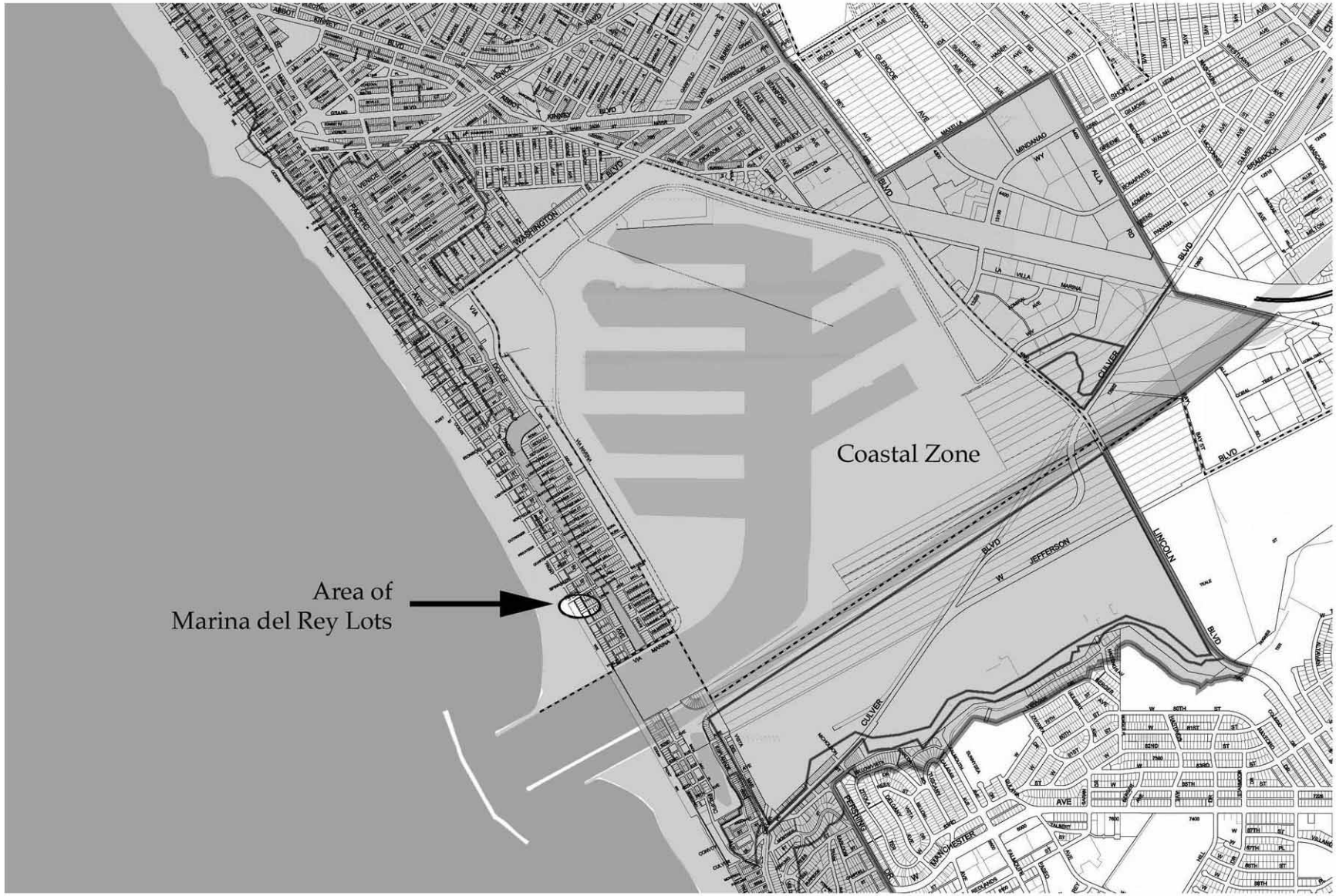
All of the 34 lots located within the CPA are within the Los Angeles Coastal Transportation Corridor Specific Plan Area. One lot in PDR, that includes well 29-1, also falls within the Coastal Bluffs Specific Plan Area.



SOURCE: Environmental Science Associates, USGS, Pacific Meridian Resources

Figure H-1

Coastal Zone- Westchester-Playa Subarea



SOURCE: Environmental Science Associates, USGS, Pacific Meridian Resources

Figure H-2

Coastal Zone- Venice Subarea

VENICE DISTRICT PLAN

The two lots on the Marina Peninsula are located in MDR. This area is part of the Venice Community Plan Area of the City of Los Angeles. The two MDR lots are also within the Coastal Transportation Corridor Specific Plan.

CITY OF LOS ANGELES GENERAL PLAN OPEN SPACE ELEMENT AND CONSERVATION ELEMENT

The Open Space Element defines areas of open space land and areas of desirable open space land. Desirable open space land indicates that certain appropriate measures should be taken to ensure continued maintenance of open space character. The Open Space Element indicates that the project site is not within a designated open space area or within a desirable open space area.

The Conservation Element indicates that the project site is not within an ecologically important area. The Public Recreation Plan, referenced in the Conservation Plan, provides the following statistics regarding neighborhood parks. The long-range goal for neighborhood recreation sites is 4 acres of parkland and open space per 1,000 people. However, recognizing the current shortage of recreation areas in the highly developed Los Angeles region, short-term and intermediate standards have been set at 2 acres of parkland and open space per 1,000 people. There are currently no neighborhood, community, or regional parks within the project area. The City of Los Angeles General Plan Open Space and Conservation Plan Elements states the following:

- Desirable open space land indicates that certain appropriate measures should be taken to ensure continued maintenance of open space character.

The Open Space Element indicates that the project site is not within a designated or desirable open space area. The Conservation Element indicates that the project site is not within an ecologically important area.

ZONING

Thirty-five of the 36 lots proposed for sale are zoned for residential use. The lots are clustered into 12 groups, as many of the lots are contiguous as shown Figure 3 and Figure 4 in the Project Description. Table H-1 shows zoning, assessor parcel numbers (APN), nearest addresses, and specific plans for each cluster of lots. Of the 33 residentially zoned lots located in Playa del Rey (PDR), 30 lots are zoned R1-1, Low Density Residential in an established area for single-family residential neighborhoods. Three of the lots are zoned R3-1, Medium Density Residential. One lot proposed for sale is zoned CR-1, Limited Commercial. This lot is located in Playa del Rey, south of Manchester Avenue on Saran Drive. The lot is located in a transition area where surrounding properties are zoned for Residential and Commercial uses (Los Angeles County, 1984). The two residentially zoned lots located in Marina del Rey (MDR) are zoned multi-family residential in an established area for multi-family units.

The R1 zone is a single-family residential zone. Permitted uses include single-family dwellings, government-owned parks, playgrounds, community centers, and permitted accessory uses. The R1 zone allows 3 to 7 dwelling units per gross acre.

TABLE H-1
ZONING AND SPECIFIC PLAN DESIGNATION

Well #	Lots	Well Name	Nearest Address	APN	Zoning	Specific Plan
1	3	Merrill 1	7851 West Manchester Avenue	4115024805	R3-1	LACTC[a]
2	5	13-1	7912 West 83rd Street	4115024805	R1-1	LACTC
3	8	23-1	7966 West 79th Street	4115028806	R1-1	LACTC
4	2	Joyce 1	7737 West 82nd Street	4114022800	R1-1	LACTC
5	3	Lormar-1	7726 West 83rd Street	4114023801	R1-1	LACTC
6	1	Anglo American	7565 81st Street	4114019801	R1-1	LACTC
7	2	O and M 1	7714 West 83rd Street	4114023800	R1-1	LACTC
8	4	Samarkand 1	8244 West 83rd Street	4115012800	R1-1	LACTC
9	3	29-2	8219 Falmouth Avenue	4115014800	R1-1	LACTC
10	2	29-1	8103 Falmouth Avenue	4115014801	R1-1	LACTC & CB[b]
11	1	Hisey-1	8600 South Saran Drive	4119001800	CR-1	LACTC
12	2	Troxel 1	5107 Ocean Front Walk, MDR	4294006019	R3-1	LACTC

[a] LACTC: Los Angeles Coastal Transportation Corridor Element;
[b] CB: Coastal Bluffs Element

SOURCE: Chambers Group, 2000

The R3 zone is a multiple dwelling zone. Permitted uses include single-family dwellings, two-family dwellings, group dwellings, multiple dwellings, or apartment houses. R3-1 Medium Density Residential allows 24-40 dwelling units per gross acre.

The CR zone is a limited commercial zone. Permitted uses include churches, government-owned parks, public parking areas, any single- or two-family dwellings, apartment houses, mini-shopping centers, restaurants, and uses wholly conducted within an enclosed building such as a hotel, bank, or office. There is a six-story height limit in the CR zone. In addition, no merchandise is to be displayed, sold, or serviced and all activities are to be conducted wholly within an enclosed building.

COASTAL TRANSPORTATION CORRIDOR SPECIFIC PLAN

The Coastal Transportation Corridor (CTC) Specific Plan states that the "purpose of the Specific Plan is to mitigate transportation impacts generated by new commercial and industrial development and to provide a mechanism to fund specific transportation improvements due to transportation impacts generated by new development" (Los Angeles, 1993). The CTC states that single-family dwellings are exempt from the provisions of this area. Thus, 30 of the 34 lots located in Playa Del Rey would be exempt due to their R1-1 zoning and the nature of the presumed development (single-family dwelling).

One lot within the PDR area is zoned CR-1, Limited Commercial. The following CTC Plan policy applies to this lot only: "For projects generating 42 or fewer trips, the applicant shall make dedications/improvements and pay the Transportation Impact Assessment fee." The lot in the MDR area is zoned R3-1, Multi-Family Residential. As no more than 15 units could be physically constructed on either of these lots, a traffic assessment is not required

COASTAL BLUFFS SPECIFIC PLAN

Officials of the City and County of Los Angeles have a cooperative agreement to jointly prepare the Local Coastal Plan under conditions stated in the Coastal Commission approved work program (Los Angeles County, 1996). The group of two lots located near the 8600 block of Calabara Road, falls within the boundaries of Sub-area 1 of the Coastal Bluffs Specific Plan. The purpose of this plan is to protect, maintain, enhance, and where feasible, restore the overall quality of the coastal environment and its natural and cultural resources (City of Los Angeles, 1994). The lots with Sub-area 1 are zoned R1-1, Low Density Residential. The following regulations apply to the development of these lots:

- Maximum height of a building or structure shall not exceed 36 feet. On an upslope lot, height shall not exceed 45 feet. No project shall exceed 25 feet in height within 10 feet of the front lot line. Provisions from LAMC Section 12.21.1 B 3, which permits additional height, shall not apply to any single-family dwelling.

- Side yards for reverse corner lots where the width of the lot is 60 feet or greater shall not be less than 10 feet in width facing the public street.

- A project extending more than 6 feet above grade shall cover no more than 40% of the lot. For a project that is substandard as to width and area may cover no more than 45% of the lot.

PLAYA VISTA SPECIFIC PLAN

The project area does not include any lots within the Playa Vista Specific Plan area.

APPENDIX I

NOISE BACKGROUND INFORMATION

APPENDIX I

NOISE BACKGROUND INFORMATION

ENVIRONMENTAL SETTING

EXISTING NOISE ENVIRONMENT

Ambient noise levels in the Playa del Rey (PDR) project area are principally affected by traffic on local streets and aircraft overflights associated with operations at Los Angeles International Airport (LAX). The only major roadway in this neighborhood is Manchester Avenue, which supports a strip of commercial businesses in the southeastern portion of the project area. The intersection of Manchester Avenue and Falmouth Avenue in PDR lies approximately 0.75 miles northwest of the northernmost runway at LAX. Santa Monica Municipal Airport lies about three miles north of Manchester Avenue. Operations at this airport do not affect noise levels in the project area.

Aircraft overflights associated with LAX operations also affect ambient noise levels in the Marina del Rey (MDR) lots. The two lots, located at the intersection of Union Jack Street and Speedway Avenue, lie approximately two miles northwest of the northernmost runway of LAX. Santa Monica Municipal Airport lies about three miles northeast of the Union Jack Street and Speedway Avenue intersection. As in PDR, operations at this airport do not affect noise levels in the project area. Unlike Playa de Rey, no major roadways run through MDR project area. However, ambient noise levels in MDR are likely to be affected by sounds of the surf, as these lots are located directly on the Venice Beach strip.

The 1992 Draft Environmental Impact Report (DEIR) for the Master Plan Project for Playa Vista determined existing noise levels in the project area by modeling conditions at 23 locations within PDR and surrounding communities. Field measurements of traffic and stationary source noise levels were compiled to verify the accuracy of the modeling results. The identification of existing noise levels was based on modeling results and field measurements. Several of the modeled locations are within the project area (Chambers, 2000).

Community Noise Equivalent Level (CNEL) at the six receptor locations within the project area ranged from a low of 51 dBA at the Loyola Marymount University Church to a high of 73 dBA in the vicinity of the Church and YMCA facilities along Sepulveda Boulevard at 80th Street. Noise levels between 64 and 71 dBA characterize most receptor locations.

According to noise contours in the City of Los Angeles General Plan Noise Element, the southernmost areas of the PDR area along Manchester Avenue are very close to the 65 dB CNEL contour for Los Angeles International Airport.

SENSITIVE RECEPTORS

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication; physiological and psychological stress; and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hospitals, and nursing homes are considered to be the most sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive.

The 36 project lots are primarily located within residential areas. Hence single family homes or apartments abut most of the project lots with the exception of Cluster 5 which is located adjacent to commercial uses.

REGULATORY SETTING

If the owner(s) of the surface rights develops the lots in the future, all development would be subject to regulations, plans and policies developed by the State of California, the City of Los Angeles and the Los Angeles County Airport land Use Commission (ALUC) to limit noise exposure at noise-sensitive land uses. These include Title 24 of the *California Code of Regulations* (for new multifamily residential developments), the Los Angeles General Plan Noise Element, the Los Angeles Municipal Code (Chapter XI- Noise Regulation), and the Los Angels Airport Land Use Plan (ALUP).

TITLE 24 OF THE CALIFORNIA CODE OF REGULATIONS

State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are collectively known as the California Noise Insulation Standards and are found in *California Code of Regulations*, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior sources, the noise insulation standards set forth an interior standard of DNL 45 dBA in any habitable room and, where such units are proposed in areas subject to noise levels greater than DNL 60 dBA, require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard. If the interior noise level depends upon windows being closed, the design for the structure must also specify a ventilation or air-conditioning system to provide a habitable interior environment. Title 24 standards are enforced through the building permit application process in Los Angeles, as in most jurisdictions.

CITY OF LOS ANGELES GENERAL PLAN NOISE ELEMENT

The City's General Plan Noise Element acts as the policy document that outlines guidelines for noise/land use compatibility for development and planning purposes. The Noise Element of the General Plan identifies compatible noise environments for different types of land uses in the City. Table I-1 contains

TABLE I-1
GUIDELINES FOR NOISE COMPATIBLE LAND USE

Land Use Category	Day-Night Average Exterior Sound Level (CNEL dB)		
	Acceptable[a]	Conditionally Acceptable[b]	Unacceptable[c]
Residential	Up to 55	Up to 70	Above 70
Transient Lodging, Hotel, Motel	Up to 55	Up to 70	Above 70
School, Library, Church, Hospital, Nursing Home	Up to 55	Up to 75	Above 75
Playgrounds, Neighborhood Parks	Up to 65	Up to 75	Above 75
Office Buildings, Business, Commercial, Professional	Up to 65	Up to 75	Above 75

[a] Specified land use is satisfactory. No noise mitigation measures are required.
[b] Use should be permitted only after careful study and inclusion of protective measures as needed for intended use and to satisfy policies of the Noise Element.
[c] Development is not feasible in accordance with the Noise Element. Use is prohibited.

SOURCE: Los Angeles Department of City Planning, Noise Element of the Los Angeles City General Plan, Feb 3, 1999

the noise/land use compatibility guidelines for those types of land uses proposed as part of the project and the existing land uses that could be affected by project-related noise. These guidelines are to be used when evaluating the noise impacts of a proposed project.

The Noise Element establishes specific programs and policies for airport, non-airport and land use development projects. Applicable policies include the following:

- For a proposed development project that is deemed to have a potentially significant noise impact on noise sensitive uses, require mitigation measures, as appropriate, in accordance with California Environmental Quality Act and city procedures. (P-11)

- Continue to plan, design and construct or oversee construction of public projects, and projects on city owned properties, so as to minimize potential noise impacts on noise sensitive uses and to maintain or reduce existing ambient noise levels. (P-13)

- Use, as appropriate, the “Guidelines for Noise Compatible Land Use” shown in Table I-1 or other measures that are acceptable to the city, to guide land use and zoning reclassification, subdivision, conditional use and use variance determinations and environmental assessment considerations, especially relative to sensitive uses, within a CNEL of 65 dB airport noise exposure areas and within a line-of-sight of freeways, major highways, railroads or truck haul routes. (P-16)

LOS ANGELES MUNICIPAL CODE NOISE REGULATIONS

The City of Los Angeles has numerous noise ordinances and enforcement practices that apply to intrusive noise and that guide new construction. The City's comprehensive noise ordinance (LAMC Section 111 et seq.) establishes sound measurement and criteria, minimum ambient noise levels for different land use zoning classifications, sound emission levels for specific uses (radios, television sets, vehicle repairs and amplified equipment, etc.), hours of operation for certain uses (construction activity, rubbish collection, etc.), standards for determining a disturbance of the peace, and legal remedies for violations. Its ambient noise standards are consistent with current state and federal noise standards. The standards guide building construction, equipment installation, equipment maintenance, and nuisance noise enforcement.

The project is located within the City and County of Los Angeles and is subject to the General Plan and noise ordinances incorporated therein. Section 41.40 of the Los Angeles Municipal Code indicates that no construction or repair work shall be performed between the hours of 9:00 p.m. and 7:00 a.m. of the following day on any weekday, since such activities would generate loud noises and disturb persons occupying sleeping quarters in any adjacent hotel dwellings or apartments or other places of residence. No person, other than an individual homeowner engaged in the repair or construction of his single-family dwelling, shall perform any construction or repair work of any kind before 8:00 a.m. or after 6:00 p.m. on any Saturday, nor at any time on any Sunday.

Section 112.05 of the Los Angeles Municipal Code specifies the maximum noise level of powered equipment or powered hand tools. Any powered equipment or powered hand tool that produces a maximum noise level exceeding 75 dBA at a distance of 50 feet from construction and industrial machinery shall be prohibited. However, the above noise limitation shall not apply where compliance is technically infeasible. Technically infeasible shall mean that the above noise limitation cannot be complied with despite the use of mufflers, shields, sound barriers and/or any other noise reduction device or techniques during the operation of equipment.

The City's Noise Ordinance also sets limits for noise levels generated by primary noise sources in an urban environment such as radios, televisions and other devices, air conditioning and heating equipment, construction noise, vehicular noise, noise from garbage collection trucks, noise from places of public entertainment, and other general noise.

Under Section 112.02, noise from air conditioning, refrigeration, and heating equipment would be considered excessive if it would cause the ambient noise level on the premises of an adjacent occupied property to increase by more than five decibels.

Mobile sources of noise are exempt from local ordinances but are still subject to CEQA review and would be significant if the project generates a volume of traffic that would result in a substantial increase in mobile-source generated noise. Because most people can readily hear a change of 5 dBA in an exterior environment, this value was established for the project as the CEQA criterion for substantial change.

A-01

SOUTHERN CALIFORNIA

ASSOCIATION of GOVERNMENTS

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Riverside County Transportation Commission: Robin Lowe, Hemet

Ventura County Transportation Commission: Bill Davis, Simi Valley

Printed on Recycled Paper 559-09/04/03

September 18, 2003

Mr. Roosevelt Grant
CPUC Environmental Project Manager
C/o Environmental Science Associates
225 Bush Street, Suite 1700
San Francisco, CA 94104-4207

RE: SCAG Clearinghouse No. I 20030521 Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey

Dear Mr. Grant:

Thank you for submitting the **Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey** for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

We have reviewed the **Southern California Gas Company's Application to Value and Sell Surplus Property at Playa del Rey and Marina del Rey**, and have determined that the proposed Project is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and California Environmental Quality Act (CEQA) Guidelines (Section 15206). Therefore, the proposed Project does not warrant comments at this time. Should there be a change in the scope of the proposed Project, we would appreciate the opportunity to review and comment at that time.

A description of the proposed Project was published in SCAG's **September 1-15, 2003** Intergovernmental Review Clearinghouse Report for public review and comment.

The project title and SCAG Clearinghouse number should be used in all correspondence with SCAG concerning this Project. Correspondence should be sent to the attention of the Clearinghouse Coordinator. If you have any questions, please contact me at (213) 236-1867. Thank you.

Sincerely,

JEFFREY M. SMITH, AICP
Senior Regional Planner
Intergovernmental Review

A-02

BOARD OF
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CALIFORNIA

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DEPARTMENT OF FIRE

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WILLIAM R. BAMATTRE
FIRE CHIEF

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September 19, 2003

Mr. Roosevelt Grant
CPUC Environmental Project Manager
c/o Environmental Science Associates
225 Bush Street, Suite 1700
San Francisco, CA 94104-4207

SALE OF SURPLUS PROPERTY PLAYA DEL REY AND VENICE BY SOUTHERN CALIFORNIA GAS COMPANY

PROJECT LOCATION

Playa Del Rey and Venice.

PROJECT DESCRIPTION

Sale of surplus property (36 separate lots).
All of the referenced properties are within the City of Los Angeles

The following comments are furnished in response to your request for this Department to review the proposed development:

A. Fire Flow

The adequacy of fire protection for a given area is based on required fire-flow, response distance from existing fire stations, and this Department's judgment for needs in the area. In general, the required fire-flow is closely related to land use. The quantity of water necessary for fire protection varies with the type of development, life hazard, occupancy, and the degree of fire hazard.

Fire-flow requirements vary from 2,000 gallons per minute (G.P.M.) in low Density Residential areas to 12,000 G.P.M. in high-density commercial or industrial areas. A minimum residual water pressure of 20 pounds per square inch (P.S.I.) is to remain in the water system, with the required gallons per minute flowing. The required fire-flow for this project has been set at 2,000 G.P.M. from 3 fire hydrants flowing simultaneously. (This requirement will be increased to 4,000 G.P.M. from 4 fire hydrants flowing simultaneously for commercial development.)

B. Response Distance, Apparatus, and Personnel

The Fire Department has existing fire stations at the following locations for initial response into the area of the proposed development:

Union Jack/Speedway – Venice (1 Lot)

FS 63 – 2.10
FS 62 – 2.87
FS 5 – 3.00

Playa Del Rey locations (35 Lots) range from 1.55 miles to 4.10 miles. Only the closest and furthest locations were calculated from the closest to the furthest fire stations. Intermediate locations would fall between these numbers. Because all of these locations are more than 1.5 miles to the nearest fire station, fire sprinklers will be required in any structures built on these sites.

The sites for which distances were calculated are as follows:

Closest site

8600 South Saran Drive

FS 5 – 1.55 miles
FS 63 – 3.58 miles
FS 95 – 3.61 miles

Furthest site

8103 Falmouth Avenue

FS 5 – 2.04 miles
FS 63 – 4.07 miles
FS 95 – 4.10 miles

C. Firefighting Access

No building or portion of a building shall be constructed more than 150 feet from the edge of a roadway of an improved street, access road, or designated fire lane.

No building or portion of a building shall be constructed more than 300 feet from an approved fire hydrant. Distance shall be computed along path of travel. Exception: Dwelling unit travel distance shall be computed to front door of unit.

Hydrants may be required after review of plot plans.

Submit plot plans for Fire Department approval of access and fire hydrants.

CONCLUSION

The proposed project shall comply with all applicable State and local codes and ordinances, and the guidelines found in the Fire Protection and Fire Prevention Plan, as well as the Safety Plan, both of which are elements of the General Plan of the City of Los Angeles C.P.C. 19708.

For additional information, please contact Inspector Griffin of the Construction Services Unit at (213) 485-5964.

WILLIAM R. BAMATTRE
Fire Chief

Alfred B. Hernandez, Assistant Fire Marshal
Bureau of Fire Prevention and Public Safety

ABH:RG:gm
c:so calif gas

A-03

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http://www.lafd.org

September 23, 2003

Mr. Roosevelt Grant
CPUC Environmental Project Manager
c/o Environmental Science Associates
225 Bush Street, Suite 1700
San Francisco, CA 94104-4207

SALE OF SURPLUS PROPERTY PLAYA DEL REY AND VENICE BY SOUTHERN CALIFORNIA GAS COMPANY

PROJECT LOCATION

Playa Del Rey and Venice.

PROJECT DESCRIPTION

Sale of surplus property (36 separate lots). All of the referenced properties are within the City of Los Angeles

The following comments are furnished in response to your request for this Department to review the proposed development:

A. Fire Flow

The adequacy of fire protection for a given area is based on required fire-flow, response distance from existing fire stations, and this Department's judgment for needs in the area. In general, the required fire-flow is closely related to land use. The quantity of water necessary for fire protection varies with the type of development, life hazard, occupancy, and the degree of fire hazard.

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The sites for which distances were calculated are as follows:

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FS 5 – 1.55 miles
FS 63 – 3.58 miles
FS 95 – 3.61 miles

Furthest site

8103 Falmouth Avenue

FS 5 – 2.04 miles
FS 63 – 4.07 miles
FS 95 – 4.10 miles

Apparatus, and Personnel

Fire Station No. 5
6621 W. Manchester Avenue
Los Angeles, CA 90045
Task Force Truck and Engine Company
Paramedic Rescue Ambulance
Battalion 4 Headquarters
Staff – 13

Fire Station No. 62
3631 Centinela Avenue
Los Angeles, CA 90066
Single Engine Company
Staff – 4

Fire Station No. 63
1930 Shell Avenue
Venice, CA 90291
Task Force Truck and Engine Company
Paramedic Rescue Ambulance
Staff – 12

Fire Station No. 95
10010 International Road
Los Angeles, CA 90045
Task Force Truck and Engine Company
Paramedic Rescue Ambulance
Staff – 12

C. Firefighting Access

No building or portion of a building shall be constructed more than 150 feet from the edge of a roadway of an improved street, access road, or designated fire lane.

No building or portion of a building shall be constructed more than 300 feet from an approved fire hydrant. Distance shall be computed along path of travel. Exception: Dwelling unit travel distance shall be computed to front door of unit.

Hydrants may be required after review of plot plans.

Submit plot plans for Fire Department approval of access and fire hydrants.

CONCLUSION

The proposed project shall comply with all applicable State and local codes and ordinances, and the guidelines found in the Fire Protection and Fire Prevention Plan, as well as the Safety Plan, both of which are elements of the General Plan of the City of Los Angeles C.P.C. 19708.

For additional information, please contact Inspector Griffin of the Construction Services Unit at (213) 482-6506.

WILLIAM R. BAMATTRE
Fire Chief

Alfred B. Hernandez, Assistant Fire Marshal
Bureau of Fire Prevention and Public Safety

ABH:RG:gm
c:so calif gas

A-04

Southern California Gas Company®

A Sempra Energy® utility

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ghealy@semprautilities.com

October 2, 2003

Mr. Roosevelt Grant
CPUC Environmental Project Manager
c/o Environmental Science Associates
225 Bush Street, Suite 1700
San Francisco, CA 94104-4207

Re: A.99-05-029 - Comments on Initial Study for Draft Environmental Impact Report for Sale of Surplus Southern California Gas Property at Playa del Rey and Marina del Rey

Dear Mr. Grant:

Southern California Gas Company ("SoCalGas") has reviewed the Initial Study for a draft environmental impact report ("DEIR") concerning the referenced action and, through these comments, wishes to correct some factual inaccuracies and ambiguities.

Initial Study

Page S-1, Section S.2 : The reference to the project area being located 0.5 miles west of Culver City, should be changed to 5 miles southwest of Culver City.

Page S-2, Section S.2, Table 1: The reference of the Well Designation of Cluster #1 as Anglo American should be more accurately referred to as Anglo American Champ #1. This change is consistent with later sections in the document which make reference to the, "Champ" cluster.

Also, with respect to Clusters 10 and 11 being near Calabara Avenue, the correct name of the street is Calabar Avenue.

Page S-7, Section S.3: The sentence "By July 1958, approximately 27 billion cubic feet (bcf) of cushion gas was stored" is either in error or ambiguous. The total capacity of the storage field in 1958 was approximately 7 bcf; it remains at about the same capacity today. If the quoted sentence was intended to mean that 28 bcf of gas had cycled in and out of the field by 1958, then the sentence needs to be rewritten to convey that meaning.

Page S-8, "Conditions of Ownership Transfer": The third sentence in this section, stating that SoCalGas is obligated in perpetuity to mitigate for any potential adverse effects the wells may have on future beneficial uses of the property, is in error. California Public Resources Code, Section 3251.5, provides that if an abandoned well leaks and requires remedial work 15 or more years after it was properly abandoned according to all requirements at the time of abandonment, the state assumes financial responsibility for the remedial work. However, SoCalGas would be responsible for repairing a leaking abandoned well if the SoCalGas storage field activities caused the leakage.

We understand that the CEQA process requires the CPUC to consult with responsible agencies, which must include the Department of Oil, Gas and Geothermal Resources ("DOGGR"). We are confident that DOGGR will be able to assist your understanding of this and other abandoned well issues and will be able to draft any appropriate mitigation measures for the CPUC to adopt in its DEIR.

Page S-10, Section S.5, #9: The reference to the project area being located 0.5 miles west of Culver City, should be changed to 5 miles southwest of Culver City.

Page S-11, Section S.5, #10: The reference to the "County of Los Angeles Sanitation Department", should be changed to the, "Sanitation Districts of Los Angeles County."

Page S-11, "Other public agencies whose approval is required": As clarification, the agencies on this list are not required to approve the proposed project; however, some or all of them may be involved, to varying extents, in any subsequent development of the lots.

Page 16, third paragraph: This paragraph is misleading by saying that, "60 odor complaints concerning the Playa del Rey Storage Field have been filed since 1988." Although we are not familiar with the reference complaints, we believe that many were due to other sources of odor (e.g. sewers, resident activities, etc.).

Page 31: There are several serious inaccuracies or ambiguities on this page with respect to the geologic conditions at the Playa del Rey Storage Field.

The first full paragraph is misleading in its statement that earthquakes can damage wells. While operating oil and gas wells have been reported to have been damaged in earthquakes, SoCalGas is not aware of reports of any damage to abandoned wells due to earthquakes. Operating wells can be damaged more easily because a casing buckle from an earthquake will prevent the well from operating. Abandoned wells are less likely to be damaged in earthquakes for several reasons, including that casings filled with cement are unlikely to buckle. Only abandoned wells are the subject of the pending lot sales.

The second full paragraph reports that the "ETI (2000) soil gas survey results suggest the possible presence of migration pathways from the gas storage reservoir to the ground surface." This statement is both misleading and substantively wrong. The conclusion of

that study, reported in ETI (2001) concluded that there was no connection between the soil gas found in the Playa Vista area and the gas storage reservoir. As a result, the conclusions drawn from this erroneous premise in the Initial Study are also incorrect. This is an important issue and it is critical that the CPUC reread the ETI soil gas survey and correct this error.

Appendix D

Page D-3: reads that the, "Company began operations after acquiring the field in 1953." In fact, SoCalGas began operation of the Playa del Rey Storage Field in 1942, although it did not complete the purchase of the field until 1953.

Appendix F

Page F-5: The second full paragraph states that "Several of these abandoned wells have buildings constructed over or adjacent to them . . .". The context of the paragraph leads the reader to believe that there are only several abandoned wells in the entire Los Angeles basin with that are covered by or adjacent to structures. In fact, there are thousands of abandoned wells below or adjacent to existing structures in the Los Angeles basin.

Page F-7: Please see comment above for page S-7, section S.3, with respect to the storage capacity of the storage reservoir.

Also, the first paragraph under "Types of Gases" instructs that processed natural gas normally has less than 0.1% hydrocarbon components that are heavier than methane. This statement is not accurate for the storage gas and pipeline quality natural gas in general. The natural gas in the Playa del Rey storage field typically has more than 5% hydrocarbons that are heavier than methane. We suspect that the erroneous definition came from a draft 1983 E.P.A. document concerning fugitive natural gas leaks; however, the docket for the final version of this document, completed in 1985, specifies a revised definition of natural gas to 10% VOC (E.P.A.'s use of VOC excludes methane and ethane) in recognition that a 1% limit would exclude pipeline natural gas and other gas streams E.P.A. wished to exempt.

Page F-11: The discussion of the Block 11 well, in paragraph 3, is misleading in that it implies that the biogenic gas leak remains unresolved. That issue was resolved in early 2001 by re-entering and re-cementing the abandoned well. The DOGGR supervised and approved this work.

The fourth paragraph states that the ETI (2000) study could not confirm the presence or absence of storage gas on the Playa Vista property. This is misleading and inflammatory. As correctly reported on page F-7, the ETI (2001), which was a continuation of the ETI (2000) study, confirmed that storage gas was not present on the Playa Vista property.

Page F-12: The last paragraph on this page does not accurately describe the responsibility for naturally occurring gas. Mineral rights ownership conveys the right to produce oil and/or gas from land. California recognizes the "law of capture" with respect to those rights. Pursuant to the "law of capture," oil and gas are not owned until they are reduced to possession. In other words, a mere mineral interest does not subject the owner to liability as long as the owner (a) takes no actions causing, or contributing to, damage another party, and (b) has complied with the laws and regulations of the governmental agencies having jurisdiction over the minerals and operations/activities related thereto.

This fundamental error emphasizes the need for the CPUC to consult and coordinate closely with DOGGR concerning oil and gas issues so that the public is not misled.

SoCalGas appreciates the opportunity to comment on the Notice of Preparation and the Initial Study for Application No. A.99-05-029. SoCalGas recommends that its foregoing comments be recognized as addressing factual inaccuracies in the Initial Study. SoCalGas looks forward to reviewing the draft EIR in the very near future.

Sincerely,

Gregory Healy

Gregory Healy

A-05

Mr. Roosevelt Grant, CPUC
Environmental Project Manager
c/o Environmental Science Associates
225 Bush St., Suite 1700
San Francisco,CA 94104-4207

October 2, 2003

RE: Initial Study for CPUC Application No. 99-05-029 – SOCALGAS Company's Application to Value and Sell Surplus Property

Dear Mr. Grant:

We have the following comments at this time on the Initial Study. We have asked for a hard copy of the Initial Study for more review in the future, as it has been difficult to download the CD in its entirety. Mr. Tim Morgan at ESA stated that we could mail in our comments by October 3rd.

Our comments at this time are the following:

1) We incorporate the information we provided to the CPUC in our previous Motion to Disqualify Environmental Consultants, comments at the Hearing, and documents that were provided following the hearing. We also incorporate the information in our Motion to Disclose SOCALGASCO well records, following documents, and those documents and Minutes from the meeting in Grassroots Offices in Los Angeles with the PUC and ESA earlier this year. We request that those Minutes be adhered to.

The Initial Study excludes some of the points we brought up in that meeting such as the focus is on the surface instead of the whole geological setting of these wells, the geological formation they go into and the effect.

2) It is unacceptable to rely on the Los Angeles City CLA Report. This report repeats the same erroneous scenario that occurred in the Playa Vista EIR of 1992. The City of LA again allowed the developer to hire the majority of consultants (7 out of 9), erasing the independence established in the previous hiring of a Peer Reviewer. Only when there was independence of the City hiring a 3rd Party (ETI) and both parties were allowed to communicate with the Reviewer, did the truth come out about the existence and seriousness of the gas seeps at Playa Vista in April 2000.

The CLA Report had no independent oversight for the protocol standard of review and did not conform to State or Federal protocol standards of review either. The CLA Report is not even done to petroleum engineering standards.

Although it includes the ETI Report of April 2000, the only other company hired by the City was Kleinfelder & Associates who did no new gas sampling for oilfield constituents. They instead relied on data that was incomplete by ETI, and on Playa Capital consultants information, e.g. CDM.

The CLA Report also included consultants now being hired by the CPUC, such as John Sepich.

The CLA Report relies on the First Phase EIR information, and we have a lawsuit pending regarding an SEIR on the gas issue.

The CLA Report was deemed incomplete by the California Department of Toxic Substances Control. They stated that all gas studies need to be performed in native soils (not disturbed), and asked for Human Health Risk and Ecological Assessments based on new gas studies to evaluate the effects of the BTEX chemicals.

A lot of available information was withheld in the CLA Report, leading to a very misleading report. Therefore, the CLA Report SHOULD NOT BE RELIED UPON for anyone's use. It has not been peer reviewed, and in fact would likely fail a peer review. Mixing of natural gases were left out, as well as no native gas samples were submitted.

We may have further comments later, but we submit these for now.

Sincerely,

Patricia McPherson, President
GRASSROOTS COALITION
3749 Greenwood Ave.
Los Angeles, CA 90066
(310) 397-5779

Kathy Knight, Wetlands Coordinator
SPIRIT OF THE SAGE COUNCIL
1122 Oak St.,
Santa Monica, CA 90405
(310) 450-5961

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

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JAMES A. NOYES, Director

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Telephone: (626) 458-5100
www.ladpw.org

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

October 23, 2003

IN REPLY PLEASE REFER TO FILE: WM-4

Mr. Roosevelt Grant
CPUC Environmental Project Manager
c/o Environmental Science Associates
225 Bush Street, Suite 1700
San Francisco, CA 94104-4207

Dear Mr. Grant:

RESPONSE TO A NOTICE OF PREPARATION
SALE OF SURPLUS SOUTHERN CALIFORNIA GAS PROPERTY AT
PLAYA DEL REY AND MARINA DEL REY

Thank you for the opportunity to provide comments on the subject document. The proposed document considers environmental impacts from the potential development of 36 lots, all residential use, except for one commercial use. The project site is located approximately 4 miles south of the City of Santa Monica and 1.5 miles north of the Los Angeles International Airport. We have reviewed the submittal and offer the following comments:

Environmental Programs

The Los Angeles County Building Code, Section 110.4 requires that buildings or structures adjacent to or within 200 feet (7620 mm) of active, abandoned or idle oil or gas wells be provided with methane gas protection systems. The project site contains or appears to contain or lie within 200 feet of active, abandoned or idle oil or gas wells. This issue should be addressed and mitigation measures provided. Our Environmental Programs Division must be contacted for issuance of necessary permits.

Should any operation within the subject project include the modification or removal of underground storage tanks, our Environmental Programs Division must be contacted for required approvals and operating permits.

If you have any questions, please contact Mr. Wilson Fong at (626) 458-3581.

Geotechnical and Materials Engineering

The Environmental Impact Report shall address the geotechnical issues identified in the Notice of Preparation/Initial Study.

Description of the project and the associated grading, i.e., existing and proposed grades, etc., must be shown on a topographic map. Also, all geotechnical hazards must be identified and any mitigation measures discussed in detail. The requested information shall be included in the appropriate documents, as requested by others.

The project is located within a mapped potentially liquefiable area, per the State of California Seismic Hazard Zone Map, Venice Quadrangle. However, a liquefaction analysis is not warranted at this time. Detailed liquefaction analyses, conforming to the requirements of the Sate of California Division of Mines and Geology Special Publication 117, must be conducted at the tentative map and/or grading/building plan stages.

If you have any questions, please contact Mr. Amir Alam at (626) 458-4925.

Land Development

Hydrology and Standard Urban Storm Water Mitigation Plan (SUSMP) Review

This report inadequately addresses SUSMP and drainage issues. The environmental document does not provide sufficient information to determine what drainage impacts, if any, the project may have towards area drainage and County facilities (storm drain Project Number 513 and storm drain Project Number 647). To properly assess any drainage and SUSMP impacts and to determine appropriate mitigation, a drainage concept/SUSMP report will be required. We recommend that the applicant prepare a drainage concept/SUSMP report showing the extent of drainage and SUSMP quality impacts, and if necessary, provide mitigation acceptable to the County. The analysis should address increases in runoff, any change in drainage patterns, treatment method proposed for SUSMP regulations, and the capacity of storm drain facilities.

We recommend that this report not be approved until our department has reviewed and approved the drainage concept/SUSMP report. We also recommend that a copy of the drainage concept/SUSMP report, once approved, be included in the environmental document.

If you have any questions, please contact Mr. Michael Hales at (626) 458-4921.

Transportation and Planning

The proposed project will not have any significant impacts on County of Los Angeles Highways.

If you have any questions, please contact Mr. Hubert Seto at (626) 458-4349.

Traffic and Lighting

The proposed project will not have any significant impact to County and County/City roadways in the area. No further information is required.

If you have any questions, please contact Ms. Jennifer Frary at (626) 300-4792.

Watershed Management

The proposed project should include investigation of watershed management opportunities to maximize capture of local rainfall on the project site, eliminate incremental increase in flows to the storm drain system, and provide filtering of flows to capture contaminants originating from the project site.

If you have any questions regarding the above comments or the environmental review process of Public Works, please contact Ms. Massie Munroe at (626) 458-4359.

Very truly yours,

JAMES A. NOYES
Director of Public Works

for ROD H. KUBOMOTO
Assistant Deputy Director
Watershed Management Division

MM:sv
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APPENDIX B

SENSITIVE INVERTEBRATES REPORT

New email address: bugdctr@comcast.net

11 August 2003

Mr. Tim Morgan
Environmental Science Associates
436 14th Street, Suite 600
Oakland, CA 94612-2727

Re: ESA Project #202639
Southern California Gas' Surplus Property in Playa del Rey and Marina del Rey, CA
Report on Sensitive Invertebrates

Dear Tim:

This report presents the findings of a habitat assessment survey for sensitive invertebrate taxa that was conducted at 36 surplus lots that are part of the Playa del Rey Natural Gas Storage Facility of Southern California Gas. In addition, I also report on my findings from a focused survey that was conducted for the Globose Dune beetle, *Coelus globosus* (Coleoptera: Tenebrionidae), at two surplus lots located in Marina del Rey. The remainder of this report provides background information on each insect and describes my survey methods, findings, and recommendations for project planning.

BACKGROUND INFORMATION

The 36 surplus lots are located within or very near the historical boundaries of the El Segundo sand dunes in that formerly occurred throughout coastal portions of the communities of Playa del Rey and Marina del Rey. Specific locations of these lots are described in the Mitigated Negative Declaration (MHA Environmental Consulting, Inc. 2001) and are not repeated herein. At least 15 sensitive insect taxa are known historically to have occurred in association with the beaches, salt marshes, or sand dunes of Los Angeles County (BUGGY Data Base 2003). These taxa are as follows:

a) *Euphilotes battoides allyni*, El Segundo Blue butterfly;
b) *Danaus plexippus*, Monarch butterfly (overwintering sites only);
c) *Panoquina panoquinoides errans*, Salt Marsh skipper;
d) *Carolella busckana*, Busck's Gall moth;
e) *Eucosma hennei*, Henne's Eucosman moth;
f) *Psammobotys fordi*, Ford's Sand Dune moth;
g) *Brennania belkini*, Belkin's Dune Tabanid fly;
h) *Rhaphiomidas terminatu terminatus*, El Segundo Flower-loving fly;
i) *Cicindela gabbi*, Tiger beetle;
j) *Cicindela hirticollis gravida*, Sandy Beach Tiger beetle;
k) *Cicindela latesignata latesignata*, Tiger beetle;

l) *Cicindela senilis frosti,* Tiger beetle;
m) *Coelus globosus,* Globose Dune beetle;
n) *Coelus pacificus,* Channel Islands Dune beetle; and
o) *Trigonoscuta dorothea dorothea,* Dorothy's El Segundo Dune weevil.

Notable among these insects is the El Segundo Blue butterfly, *Euphilotes battoides allyni*, which is a federally-listed endangered species. The remaining 14 insects are recognized as species of special concern by the U.S. Fish & Wildlife Service or are tracked by the California Natural Diversity Data Base. Although these insects are not considered endangered or threatened at this time, they satisfy the definition of rare species under the California Environmental Quality Act (CEQA).

During my habitat assessment survey of the 36 lots, I searched for habitat conditions suitable to support the 15 aforementioned sensitive insects. Suitable habitat was observed for two of the insects, namely the Globose Dune beetle and the Monarch butterfly. Background information is provided on these two insects.

Globose Dune Beetle.

The genus *Coelus* includes five species of fossorial (i.e., burrowing) beetles that inhabit sand dunes along the Pacific Coast of North America. The Globose Dune beetle (GDB), *Coelus globosus,* was described by LeConte in 1851.

It occurs at scattered dune localities from Mendocino County, California to Ensenada, Baja California, Mexico. The GDB is also known from all of the Channel Islands except San Clemente Island. According to Doyen (1976), major populations occur at the Point Reyes Peninsula (Mann County), Santa Cruz (Santa Cruz County), Monterey Bay (Monterey County), Pismo Beach and Morro Bay (San Luis Obispo County). Other historical records are from Punta Gorda, Oxnard, and near Ventura (Ventura County), National City, San Diego, Coronado, and Tijuana River mouth (San Diego County), Del Monte, Little Sur Beach, Carmel, and near Big Sur (Monterey County), Goleta and Santa Barbara (Santa Barbara County), San Jose (Santa Clara County), Zuma Creek, El Segundo Dunes, Ballona Wetlands, Redondo Beach, Coral Beach, and Malibu Beach (Los Angeles County), Huntington Beach, Newport Beach and Laguna Beach (Orange County), and Manchester State Beach (Mendocino County). However, habitat at many of these historical locations has been destroyed and the status of GDB is uncertain. The type locality is San Diego.

Despite the beetle's extensive geographic range along the Pacific Coast, throughout most of its range GDB is restricted to foredunes immediately bordering the sea. At many locations, the foredunes, which are usually a narrow band of open or sparsely vegetated loose sand, generally extend no more than approximately 50 meters inland from the mean high tide line.

This flightless beetle spends nearly its entire life burrowing in loose sandy areas where common dune plants such as Sand Verbena *(Abronia maritima*: Nyctaginaceae), Beach Burr (*Ambrosia chamissonis:* Compositae), and Sea Rocket *(Cakile maritima:* Cruciferae) grow. Immature life stages of the beetle also are found buried in the sand. Adults and larvae are sometimes found in open sandy areas, but more typically are found in the sand about 5 to 10 cm.

beneath the above-noted plants.

Habitat for the Globose Dune beetle has been destroyed or altered at many locations throughout its geographic range. Recreational activities, urbanization, sand mining, encroachment by annual grasses, weeds, ice plant, and European Beach grass are factors that have contributed to the decline of the GDB. Slobodchikoff and Doyen (1977) studied sand-dwelling beetles and insects at a number of locations where European Beach grass had been introduced to stabilize sand dunes and found a greatly reduced species diversity of native entomofauna, which was attributed to alteration of the microhabitat conditions by roots of the introduced grass. For these reasons, the USFWS (1989) recognized the GDB as a category 2 candidate for endangered or threatened species status. More recently, it has been treated as a species of special concern.

Monarch Butterfly.

Due to its nearly worldwide distribution and annual migration behavior, the Monarch butterfly is one of the best-known insects in the world. Its annual migrations to California and central Mexico are legendary. However, this migratory phenomenon is threatened due to loss of habitat in areas favored by the butterfly to survive the winter months. Thus the conservation of overwintering sites of the Monarch has become a high priority for the International Union for the Conservation of Nature and Natural Resources (IUCN) and government resource agencies. The IUCN (1983) recognized the Monarch's winter roosting sites in California and Mexico as a "threatened phenomenon".

At this time, Monarchs are not specifically protected under federal or state laws, however, in California the butterfly and its overwintering habitats can be indirectly conserved under two statutes dealing with natural resources and the environment, namely the Public Resources Code and the Fish and Game Code. The primary agencies responsible for administering and enforcing the former statute are the California Coastal Commission and the California Department of Parks and Recreation, while the California Department of Fish & Game (CDF&G) is responsible for the latter statute. CDF&G tracks the locations of Monarch overwintering sites through the California Natural Diversity Data Base (CNDDB).

Monarchs and their relatives are tropical butterflies, thus they cannot survive the colder winter months of most parts of North America. For this reason, Monarch butterflies travel during the fall months of each year to their wintering areas where temperatures are more moderate. In general, Monarchs that live west of the Rocky Mountains migrate to coastal areas of California, while those that live east of the Rockies travel to a few sites in the mountains of Central Mexico. In coastal California, overwintering sites (also referred to as winter roosting sites) range from northern Baja California to southern Mendocino County, and most overwintering sites are usually located within 0.5 to 1 mile of the coast.

In California, clustering behavior begins once migrating Monarchs reach their overwintering sites in the fall. Two types of clustering occur:

a) temporary aggregations that are transient clusters of short duration; and
b) permanent roosts that are long term (past the winter solstice) hibernal clusters, where overwintering occurs, which also possess the environmental conditions that allow the

butterflies to mate in January and February before their spring dispersal (Urquhart 1960). I should note that the term "permanent" is a misnomer since changes in habitat conditions may cause Monarchs to not use a particular site for winter roosting, thus I prefer the terms "overwintering sites" or "winter roosting sites" to refer to "permanent roosts" and use these terms interchangeably in this report.

In the fall months, typically in September and October, numerous, generally small temporary aggregations are formed, especially in areas where nectar plants are plentiful near the coast. Monarchs at many of these sites disperse to permanent roosting sites as nectar sources, air temperature, and day length decrease. Some sites may serve as permanent roosts one year and temporary aggregations another year, or a mixture of the two. Also, some locations may not be used for either purpose for a period of time. Thus site fidelity can vary dramatically over a period of years.

The formation of Monarch aggregations and their persistence is dynamic. Generally, sites that support larger aggregations tend to form more predicatably (i.e., higher fidelity) year after year and routinely persist beyond the winter solstice (i.e., more permanence) than sites that support smaller aggregations. Several factors are known to influence these dynamics, including changes in site quality, variation in local seasonal weather conditions, and cyclic variation in the overall abundance of Monarchs from year-to-year (Tuskes and Brower 1978). Also, the date of aggregation breakup varies with seasonal weather conditions. It can occur as early as late January in warm, dry years, or as late as March in cool, wet years. The timing of aggregation breakup is usually correlated with the onset of sexual activity, which is influenced by the weather.

Overwintering sites are usually characterized by groves of trees of mixed height and diameter, with an understory of brush and sapling trees. Often there is a small clearing within a stand of trees, or formed by a combination of the trees and surrounding topography, to provide shelter for the butterfly. These overwintering sites protect the butterfly from prevailing on-shore winds and freezing temperatures, plus exposure to the sun. The vegetation serves as a thermal "blanket" which moderates extreme weather conditions (Calvert and Brower 1982).

Recent research has demonstrated that forest canopy structure is a primary determinant of microclimatic conditions in forest stands, and is undoubtedly an important factor in the Monarch's selection of particular locations as overwintering roosts (Bell 1997; Leong 1990; Sakai et al. 1989; Weiss et al. 1991). Many of the best overwintering sites provide a heterogeneous mixture of habitat conditions and resultant microclimatic conditions that allow the Monarchs to survive seasonal changes in climatic conditions during the winter. For example, overwintering habitats must provide wind protected roost locations (usually tree branches that are 15-50 feet above ground), with buffered temperatures, relatively high humidity, and filtered sunlight throughout the fall and winter months. As weather conditions and exposure to sunlight vary over the winter months, greater habitat heterogeneity at an overwintering site permits the Monarch roosts to satisfy their thermoregulatory needs by moving from tree to tree in response to changes in weather conditions. Thus during the early part of the overwintering period (October – November), when daily temperature maxima are relatively high, Monarchs tend to cluster in locations that provide brief morning insolation, with mid-day and afternoon shade.

Later in the season (December – February), when temperature maxima are lower, they tend to roost in trees that receive afternoon sunlight. Trees surrounding roost locations, known as windbreak or buffer trees, provide both wind protection and ameliorate microclimatic conditions near the roost trees.

A number of cluster sites in coastal California are located in groves of introduced trees. Favored trees for Monarch roosts include, Blue Gum *(Eucalyptus globulus),* River Gum *(E. camaldulensis),* Monterey Pine *(Pinus radiata),* and Monterey Cypress *(Cupressus macrocarpa),* although a number of other native and introduced species of trees are less frequently utilized (Lane 1993). Clusters typically form between about 15 and 50 feet above ground, but have been observed as low as 6 feet and as high as 75 feet.

Cluster sites are protected from winds by a combination of tree cover (i.e., spatial configuration and density) and topography. Gullies, canyons, creek drainages, and the lee sides of hills are areas where Monarchs typically roost, if the appropriate tree cover is present. Man-made structures can also provide protection. Although the butterflies are inactive on colder, rainy, or foggy days, they will fly from the cluster on warmer, sunny days to obtain the water and nectar that are needed to sustain the butterflies through the winter. Thus, a nearby source of water and an abundance of fall and winter-blooming nectar plants are also important factors in determining where the butterflies will roost. Monarchs can obtain water from natural or man-made bodies of water, runoff from sprinklers, and dew on vegetation (Nagano and Lane 1985). Important nectar plants at many winter roosting sites include, *Eucalyptus* trees, Coyote Bush *(Baccharis),* wild mustard *(Brassica),* and Bottlebrush *(Callistemon),* although other native and introduced species will be used if available.

In concluding this discussion, I would like to emphasize that although a number of basic features are important determinants in the suitability of a particular location to serve as a winter roosting site by the Monarch butterfly, there is also an interaction of these and other factors that is only beginning to be understood by researchers. Also, because features of a site can change due to various factors such as the growth of trees and understory vegetation, thinning or removal of trees, removal of brush, and changes in nectar plant abundance, Monarch usage of a particular site may vary from year-to-year and for longer durations. Indeed, new roosting sites continue to be discovered in California as conditions become favorable, even in areas where roosts were not previously observed. Similarly, when habitat quality deteriorates at locations that previously supported winter roosts, Monarchs will cease to roost at these sites. Clearing of brush and thinning of trees are common vegetation management practices that have adversely impacted Monarch roosting sites, even on public lands (Nagano and Lane 1985; Weiss et al. 1991).

SURVEY METHODS

My habitat assessment survey of the 36 surplus lots was conducted on May 12th, 2003. I hiked throughout each of the properties, except for the two adjacent lots in Marina del Rey that were enclosed by a fence and locked gate. At each location I searched for food plants or other features that provide suitable habitat for each of the 15 sensitive insects on my master list of potential taxa.

Based on the findings of my habitat assessment survey, a focused survey for the Globose Dune beetle was conducted at two adjacent lots located in Marina del Rey on May 28th, 2003. Adults of the beetle are active throughout the year and live in the sand. During this survey I sifted sand located underneath Sea Rocket that grew along the western border of the two lots. Specimens of the beetle were preserved in ethanol and identified in my office using a stereomicroscope and pertinent entomological literature.

SURVEY RESULTS

Habitat Assessment Survey.

Native habitats at most of the 36 surplus have been severely degraded by past and current land uses. At most sites the native flora has been largely replaced by weeds and ornamental plants. As a result, the vast majority of the surplus lots do not provide suitable habitat for any of the 15 sensitive insects treated in this report. Exceptions include two clusters of surplus lots:

a) cluster 8 at 79th St/83rd St./Gulana St. in Playa del Rey (8 lots); and
b) cluster 12 at Union Jack St./Speedway Ave. in Marina del Rey (2 lots).

Several eucalyptus trees grow at Cluster 8, with ivy climbing up their trunks and on the ground. Although these plants are not native, they are essential components of potential overwintering habitat for the Monarch butterfly. This butterfly roosts on eucalyptus trees during the fall and winter overwintering period, and ivy is an important nectar source in the fall when few other butterfly-compatible nectar plants are flowering. The surrounding topography, trees on neighboring parcels, and the surrounding residences afford this site some shelter.

A small sand mound at Cluster 12 supports Sea Rocket and loose sand, factors that comprise suitable habitat for the Globose Dune beetle. Figure 1 is a photograph that illustrates this sand mound, which is situated along the western border of the site. Because the potentially suitable habitat for this beetle was identified at Cluster 12, I recommended that a focused presence-absence survey be performed for the beetle.

Focused Survey for the Globose Dune Beetle.

Approximately 15 adults of the Globose Dune beetle were found at various locations in the sand mound (Figure 1) of Cluster 12 on May 28th, 2003. No adults of the beetle were observed burrowing in the flatter portions of this site (i.e., in the foreground of Figure 1).

EVALUATION OF PROJECT IMPACTS AND RECOMMENDATIONS

Globose Dune Beetle.

My evaluation of impacts assumes that the surplus lots will be sold and that future development on them is likely to occur. The sale of the 34 surplus lots located in Playa del Rey would not affect the beetle since it does not occur there and those lots do not support suitable habitat for the beetle. Since no impacts to the beetle or its habitat are anticipated at the 34 lots, no mitigation is necessary.

While the sale of the two surplus lots at Cluster 12 in Marina del Rey would not necessarily impact the beetle, certain types of future uses of these properties, such as

development, would. On-site mitigation may be tricky as any development or other uses of the property could have both direct and indirect impacts on the small portion of the site that actually supports the beetle.

In addition, current uses of these lots by the neighbors may have an adverse impact on the beetle before their sale. Because the beetle habitat at Cluster 12 is so small in size, the habitat and beetle are particularly vulnerable. Neighbors have scattered wildflower seed (including a number of exotics), have planted a garden, and are watering the site with a spray sprinkler. The introduction of exotics, increased vegetation cover, especially on the sand mound inhabited by the beetle, and ground saturation outside of the normal rainy season period, are factors that could adversely affect the beetle.

Monarch Butterfly.

Although the 8 lots at Cluster 8 are not a documented overwintering site for the Monarch butterfly (California Natural Diversity Data Base 2003), new locations are discovered every year. I suspect that if this location is utilized by the Monarch, it is a temporary aggregation site used in the fall. Surveys would need to be conducted during the fall, from about mid-September through the end of November to determine if the site is used by the Monarch in this manner. It is unlikely to be a winter aggregation site as the tree canopy is rather limited.

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If you have any questions about my survey or this report, please give me a call.

Sincerely,

Richard A. Arnold, Ph.D.
President

Attachment: Figure 1

APPENDIX C

SUMMARY OF RESULTS FOR MONARCH BUTTERFLY SURVEYS

ESA Environmental Science Associates

M E M O R A N D U M

TO • Tim Morgan, Project Manager

FROM • Chris Mundhenk

DATE • January 26, 2004

SUBJECT • Summary of Results for Playa Del Rey Monarch Butterfly Surveys - 202639

During the months of November and December of 2003, Dr. Richard Arnold of Entomological Consulting Services, Ltd. (ECS) and Chris Mundhenk of ESA conducted surveys for monarch butterfly (*Danaus plexippus*) at the Samarkand site (Cluster 9) on a portion of the Playa Del Rey (PDR) project site. Surveys of the site, referred to hereafter as the "survey site," were conducted on November 14 (ESA), December 6 (ESA), December 12 (ECS) and December 18 (ESA). The purpose of the surveys was to determine the potential use of the survey site as overwintering habitat (also referred to as winter roosting sites) for monarch butterfly.

This memo summarizes the results of the aforementioned surveys conducted in November and December of 2003. For life history information on monarch butterfly, please refer to *Southern California Gas' Surplus Property in Playa del Rey and Marina del Rey, CA Report on Sensitive Invertebrates* prepared by ECS (Arnold, 2003).

SITE DESCRIPTION

The survey site is located on an undeveloped lot (Cluster 9), located approximately 100 feet northeast of the intersection of Delgany Avenue and 83rd Street. It is situated in a moderately-developed area with single-family residences to the north, east, and west, and multi-family dwellings located to the south of the survey site. The site slopes gently (5-15% down gradient) to the south. Blue-gum eucalyptus (*Eucalyptus globulus*) trees are located predominantly along the northern and western edges of the survey site. These trees are an indicator of potential monarch butterfly overwintering habitat. The survey site is protected from the wind by the surrounding area (trees and offsite buildings), as well as the existing topography of the area.

The nearest reported occurrence of monarch butterfly is on the south edge of the Ballona wetlands. In this area, numerous monarch butterflies were observed in 1988, 1990 and December 1997 in dense eucalyptus grove (CDFG, 2003).

METHODS

As mentioned above, the site was surveyed on four separate occasions (November 14 and December 6, 12, and 18, 2003). Each survey was conducted for a period of 1-2 hours and involved an in-depth scan

of each tree on the site, using binoculars when necessary, looking for roosting monarch butterfly species. Surveys were conducted in the morning to early afternoon with mid- to heavy-cloud cover and temperatures ranging from the low-60s to low-70s. Under these conditions, the potential for viewing roosting monarch butterfly species would be considered moderate to good.

RESULTS

No identifiable roosts were seen during any of the four surveys conducted at the site. One monarch was observed during the November 14 survey visit, but on no other occasion were monarchs observed at the survey site.

CONCLUSIONS

The potential for monarch butterfly to use the survey site as overwintering habitat is considered low. At best, the survey site may serve as a temporary aggregation site, primarily in the fall months, when monarch butterfly species gather for a time before moving on to a more full-term roosting area. For this reason, any tree removal activities at the site should avoid September through December, which represents the optimal period for monarch butterfly species roosting.

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APPENDIX D

BIOLOGICAL TECHNICAL REPORT FOR SALE OF SOCAL GAS PROPERTIES PLAYA DEL REY AND MARINA DEL REY

BIOLOGICAL TECHNICAL REPORT
SALE OF SOCALGAS PROPERTIES
PLAYA DEL REY AND MARINA DEL REY, CITY AND COUNTY OF LOS ANGELES, CALIFORNIA

Prepared for:

SOUTHERN CALIFORNIA GAS COMPANY
555 West Fifth Street
Los Angeles, CA 90013-1011

Prepared by:

CHAMBERS GROUP, INC.
17671 Cowan Avenue, Suite 100
Irvine, California 92614
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April 2000

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ABSTRACT

The Southern California Gas Company (SoCalGas) [now known as Sempra Energy] is proposing to sell 36 lots at eleven different sites within the residential part of the communities of Playa Del Rey and Marina Del Rey located in the City and County of Los Angeles, California. A reconnaissance-level biological resources survey was conducted by Chambers Group at the sites to document the existing biological conditions, and to assess the habitat for its potential to support native plant and wildlife species. The reconnaissance-level survey evaluated the potential for sensitive vegetation and wildlife to inhabit the sites.

The sites are found with an area approximately one mile by one-half mile (approximately 320 acres), each site is between about 0.5 to 2 acres. A moderately dense urban residential area, dominated by landscaping with nonnative species characterizes the sites.

No sensitive habitats or wildlife migration corridors are present on the sites and no jurisdictional waters are present on or adjacent to the sites. Nonnative landscaping covers all sites. Wildlife species detected were characteristic of disturbed urban habitats. No sensitive wildlife species are likely to inhabit the sites or adjacent areas.

No significant impacts are expected to vegetation or wildlife resources as a result of the proposed project. Two trees that may fall under the jurisdiction of City or County tree ordinances are found at two different sites. The proposed project (sale of the lots) would have no direct effect on these trees and not require permits, although future development of the sites could require such permits. No monitoring or mitigation measures are recommended.

Prepared by:
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SECTION 1.0 - INTRODUCTION

1.1 PURPOSE OF STUDY

General biological resources surveys were conducted by Chambers Group at the project sites to document existing biological conditions and to assess the habitat for its potential to support sensitive plant and wildlife species.

1.2 RELEVANT FEDERAL, STATE, AND LOCAL LAWS

This section briefly describes federal, state, and local legislation that applies to the protection of biological resources at this sites.

1.2.1 Federal Legislation

Federal Endangered Species Act of 1973 (ESA)

This Act prohibits activity that adversely affects any federally listed threatened or endangered species or their designated critical habitats. The Act also establishes a process for consultation and evaluation by the U.S. Fish and Wildlife Service (USFWS) of proposed federal projects. Through the consultation process and specific provisions for habitat preservation, the ESA provides federal protection for species and habitat diversity, especially in cases where habitat loss has caused species endangerment. Federal courts have consistently interpreted the Act to afford strong protection to protected species and their habitat.

The ESA requires the USFWS to identify taxa of wildlife and plants that are endangered or threatened, based on the best available scientific and commercial information. The federal status listings are defined as follows:

Endangered: "Any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this ESA would present an overwhelming and overriding risk to man."

Threatened: "Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

Candidate: "Those species for which the FWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list but issuance of the proposed rule is precluded."

Proposed: "Taxa for which a general notice and a proposed regulation for listing have been published in the Federal Register."

Species of Concern: A federal species of concern has no official definition under ESA, however, the local office of the USFWS may maintain a list of taxa, which may become candidates for official listing.

Migratory Bird Treaty Act

This Act placed all migratory birds under federal jurisdiction and protection. It prohibits the capture, killing, or possession of any bird species identified by various international conventions. Conventions to protect migratory birds have been signed with Great Britain, Mexico, Japan, and Russia. In this Act, the federal government is provided with the authority to establish threshold regulations that governs the hunting and management of listed species. This Act does not provide for acquisition of habitat.

National Environmental Policy Act (NEPA)

This Act requires all federal agencies to assess the impacts of proposed actions on the environment, examine alternatives, and propose mitigation measures for significant adverse impacts. NEPA does not specifically require measures to preserve habitat diversity. The identification of impacts and alternatives to proposed actions often results, however, in decisions to avoid, minimize, or compensate for losses of particularly valuable or scarce habitats.

Clean Water Act

Section 404 of the Clean Water Act regulates discharge of materials in "waters of the U.S." Under this provision, the Army Corps of Engineers must issue permits for deposit of fills in waterways and wetland areas on both public and private lands. Other federal agencies (e.g., USFWS and Environmental Protection Agency) provide recommendations concerning whether permits should be issued and under what conditions. Section 401 of the Clean Water Act requires every applicant to also request state certification that the proposed activity will not violate state and federal water quality standards. State 401 certification is often needed even for activities that fall under the Corps' Section 404 "Nationwide Permit."

1.2.2 State Laws

California Endangered Species Act

This act establishes a state policy to conserve, protect, restore, and enhance designated threatened and endangered species and their habitats. The Act authorizes the acquisition of habitat to conserve threatened and endangered species. The Act also protects listed fish, wildlife, and plant species from unauthorized taking, importing, exporting, or selling. An exemption, however, greatly reduces the protection of plants on private land.

The Act also establishes a consultation process between state agencies and the California Department of Fish and Game (CDFG). If the CDFG determines that a project will jeopardize a designated species or adversely modify its essential habitat, the Lead Agency must implement CDFG's alternatives to avoid jeopardy. The Act includes exceptions to the alternatives requirement and applies only to state-approved projects. Private projects do not require consultation under the Act. However, taking is still prohibited without a permit pursuant to Section 2081 of the CDFG Code.

The CDFG status definitions are as follows:

Endangered: "A native species or subspecies of a bird, mammal, fish, amphibian, reptile or plant which is in serious danger of becoming extinct throughout all or a significant portion of its range due to one or more causes, including loss of habitat, change in habitat, over exploitation, predation, competition or disease."

Threatened: "A native species or subspecies of a bird, mammal, fish, amphibian, reptile or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter." (Chapter 1.5 of the California Fish and Game Code.)

Rare: "A species, subspecies or variety is rare when, although not presently threatened with extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens."

Candidate: "A native species or subspecies of a bird, mammal, fish, amphibian, reptile or plant that the commission has formally noticed as being under review by the department for addition to either the list of endangered species or the list of threatened species, or a species for which the commission has published a notice of proposed regulation to add the species to either list."

Species of Special Concern: "Native species or subspecies that have become vulnerable to extinction because of declining population levels, limited ranges or rarity. The goal is to prevent these animals from becoming endangered by addressing the issues of concern early enough to secure long-term viability for these species."

California Environmental Quality Act (CEQA)

This Act requires state and local agencies to evaluate the environmental impacts of proposed projects and avoid or mitigate impacts to the environment. CEQA also provides that agencies can approve or undertake projects that will significantly impact the environment if the agency makes specific findings of overriding considerations.

Fish and Game Code of California

Pursuant to Division 2, Chapter 6, Sections 1600-1603 of the California Fish and Game Code, CDFG regulates all diversions, obstruction, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife.

The Fish and Game Code also contains numerous sections that prohibit taking or possessing state-designated, fully protected species of birds, mammals, fish, amphibians, and reptiles. Codes also exist to protect raptor habitat and raptor nests.

Native Plant Protection Act

This Act prohibits taking, importing, or selling rare or endangered plant species subject to several broad exceptions. The exceptions include the possession or sale of real property on which the plant is growing, loss to agricultural practices, including the clearing of land, and loss during authorized timber harvest operations. The exceptions are limited: if the CDFG has notified the landowner of the presence of a rare or endangered species, the landowner must give CDFG 10 days' notice before destroying protected plants to allow an attempt to salvage the species. The only lands on which the Act affords full protection are public lands with uses other than resource development.

1.2.3 Local Guidance

Proposed Woodland or Protected Tree Ordinance for Los Angeles County (Revised November 29, 1999)

The County has proposed changes to Title 22 of the Los Angeles County Code. These changes would amend the Oak Tree Permit to become the Woodland or Protected Tree Permit. The amended ordinance is meant to preserve native woodlands and individual oak, California walnut, Joshua, and western sycamore trees. Protected trees are those greater than six inches at four and one-half feet above the natural grade (Diameter at breast height or DBH). Several documents are required for a permit including site plans, a Woodland or Protected Tree Report (WPTR), and a Biological Constraints Analysis (BCA). These include such information as a detailed site description (location, drainages, plant and animal species present or potentially present) and a general description of adjacent lands.

City of Los Angeles Preservation of Oak Tree Ordinance (City Municipal Code, Chapter IV, Article 6)

This ordinance prohibits the relocation or removal of oak trees (as defined by the City) without a permit. It also prohibits (without a permit) activities that will cause an oak tree to die such as damage to the root system, fire, application of toxic substances, operation of equipment of machinery, or grading and filling within the dripline of the tree.

1.3 PROJECT DESCRIPTION

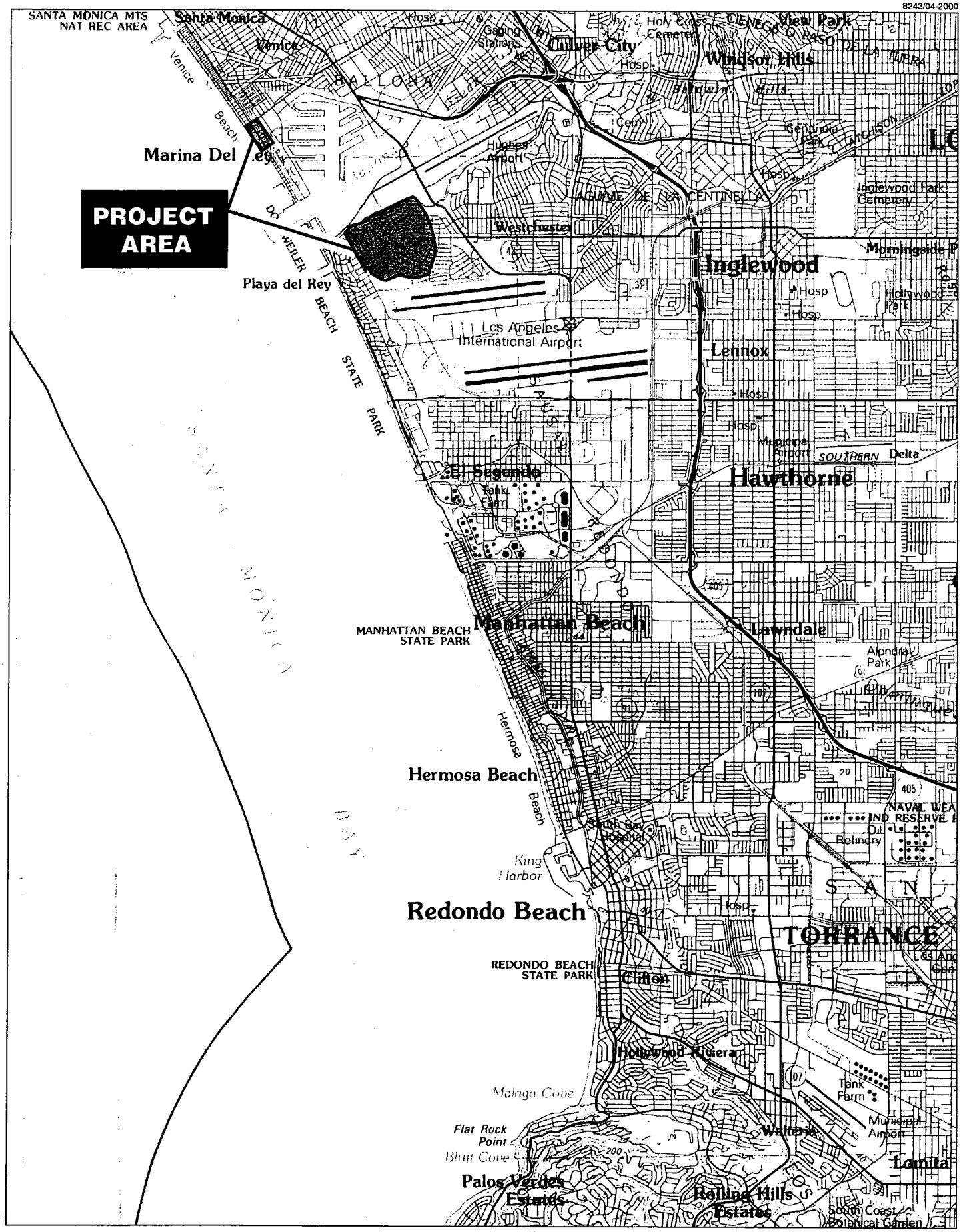
The project sites are defined as the 36 lots that SoCalGas proposes to sell. Thirty-four of these lots are found within the community of Playa Del Rey in the City of Los Angeles, Los Angeles County, California (Figures 1). Two of the lots are within the community of Marina Del Rey, also within the City of Los Angeles. The 36 lots are found generally in groups of several lots. The overall area is approximately one mile in an east-west direction and one-half mile in the north-south direction. The overall area varies in elevation from approximately 100 feet to 150 feet. Access to the area is provided by numerous paved roads, with Culver Boulevard (north and west), Lincoln Avenue (north and east), and Manchester Avenue (south) being the main thoroughfares.

SoCalGas proposes the sale of the 36 undeveloped lots within an established residential neighborhood, 35 of which are residentially zoned and one commercially zoned. The sale of the lots will only transfer the ownership of surface rights. Subsurface rights will remain with SoCalGas. The sale of surface rights does not carry with it any action to develop the lots. Any subsequent development will be the responsibility of the new owner. However, this report does analyze development of these lots consistent with their current zoning. This report is also expected to meet the requirements of the County for a WPTR and BCA.

1.4 PROJECT SCHEDULE

The sale of the 36 lots would be completed during the 2000 calendar year.

8243/04-2000



Chambers Group

SCALE: 1:100,000-scale metric
30 x 60 minute Quadrangle
Topographic Map of Long Beach CA.

REGIONAL LOCATION
Figure 1

SECTION 2.0 - METHODS AND SURVEY LIMITATIONS

2.1 PHYSICAL CHARACTERISTICS

Prior to conducting surveys, a literature review was performed to review previous studies of biological resources in the area and to determine whether there were existing records of sensitive species and habitats at or within the vicinity of the project sites. The California Natural Diversity Database (CNDDB) and the California Native Plant Society's Electronic Inventory (CNPSEI) were reviewed for information in the project area. Physical characteristics of the project sites were noted during the field surveys. Attributes recorded included existing land use onsite and in adjacent areas, slope and aspect, topographical characteristics, water resources, soil and rock types, rock outcrops, and existing disturbances.

Lots were grouped into "sites" when they were adjacent to each other, resulting in eleven sites. Each site ranges from one lot to eight.

2.2 SENSITIVE HABITATS AND JURISDICTIONAL WATERS

Sensitive habitats include those listed by the CDFG as sensitive, areas listed by the state of California as Significant Natural Areas (SNAs), or other areas uncommon in the region, including wildlife movement corridors. Jurisdictional waters are drainages, creeks, or streams that would fall under the jurisdiction of the Clean Water Act or Section 1600-1603 of the California Fish and Game Code.

2.3 VEGETATION COMMUNITIES

Kathryn Buescher, a qualified biologist from Chambers Group, conducted biological reconnaissance surveys of the site on March 21, 2000. All lots were examined and a tree and shrub species list was compiled by using existing paved roads and walking throughout all lots on foot. Sites were mapped and photos were taken at every site. Plant nomenclature follows that of The Jepson Manual, Higher Plants of California (Hickman 1993).

2.4 WILDLIFE

Habitats within and adjacent to the project area were examined during the biological reconnaissance surveys. All detections of wildlife or wildlife sign (tracks, fecal material, carcasses, nests, excavations, or vocalizations) were recorded. Literature sources were referenced for pertinent ecological information (e.g., Peterson 1990 and Stebbins 1985).

2.5 SENSITIVE SPECIES

Prior to the survey, the most recent records of several sources were reviewed to establish the potential presence of threatened, endangered, candidate, or other sensitive species in the study area:

- The California Natural Diversity Database (CNDDB 1999; Venice); and
- The California Native Plant Society's Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPSEI 1999; Venice).

Based on these searches, a list of sensitive wildlife species potentially occurring in the project area was developed. The potential for each species to occur in the project area was assessed based on the following criteria:

- *Low potential for occurrence.* No recent or historical records exist of the species occurring in the project area and the diagnostic habitat requirements strongly associated with the species do not occur in the project area or its immediate vicinity.

- *Moderate potential for occurrence.* Either a historical record exists of the species in the project area or the diagnostic habitat requirements associated with the species do occur in the project area or its immediate vicinity.

- *High potential for occurrence.* Both a historical record exists of the species in the project area and the diagnostic habitat requirements strongly associated with the species do occur in the project area or its immediate vicinity.

- *Species present.* The species was observed in the project area at the time of the survey.

SECTION 3.0 - SURVEY RESULTS

3.1 PHYSICAL CHARACTERISTICS

The sites consist of lots of varying sizes. Only one site (**C**) contains a structure, which is an abandoned SoCalGas facility. All sites except for **F** are surrounded by residential uses such as adjacent lots with one-family residences or small apartment buildings, and residential streets. Site **F** is surrounded by commercial uses to the north and northeast, a parking lot to the east, an alley and large apartment complex to the south, and a residential street (Saran Drive) to the west.

The Playa Del Rey sites are located on the southern California coast approximately one-half mile south of the Ballona wetlands, one mile east of Dockweller Beach State Park, and one mile north of the northern boundary of Los Angeles International Airport. The sites are found on a bluff from which a steep cliff descends approximately 100 feet to the Ballona wetlands. The bluff itself is relatively flat with very little aspect. The Marina Del Rey site is located on the southern California Coast, adjacent to Venice Beach, north of the Marina Del Rey Entrance Channel. Soils in both areas are sandy and very disturbed by residential development. Many years of urban uses have resulted in low biological values at the sites.

No streams or drainages cross the project sites. All culverts in the area drain storm water from the residential area. None of the project sites are likely to be used as wildlife movement corridors because they are all surrounded by residential development.

3.2 SENSITIVE HABITATS AND JURISDICTIONAL WATERS

The CNDDB search resulted in the identification of two sensitive habitats in the project area, southern dune scrub and southern coastal salt marsh. Neither of these habitats is found on any of the project sites. Southern dune scrub is found at the El Segundo Dunes just west of the runways at the airport, approximately one mile west from the project area. Southern coastal salt marsh is found at the Ballona wetlands approximately one-half mile north of the project area. None of the sites provide wildlife movement corridors to either El Segundo Dunes or the Ballona wetlands. No jurisdictional waters are present on or directly adjacent to the project sites.

3.3 VEGETATION COMMUNITIES

All sites can be described as urban landscaped vegetation. All ten sites in Playa del Rey have ground cover that includes landscaping grasses, iceplant (SP), agave (*Agave* sp.), and/or ivy (*Hedera* spp.), all nonnative species. Most of the sites support one or more mature trees, the majority of which are nonnative. The site in Marina del Rey is not landscaped. The following discussion presents vegetation for each site and Table 1 provides scientific names and native/nonnative status for the shrubs and trees discussed.

Lots 5, 6, 7, 8 on 83rd Street Ground cover that is approximately half ivy/iceplant, and half grass covers this site. Ivy and iceplant vegetation on this site is dense and supports many agave plants. The site supports approximately 18 mature eucalyptus trees. In addition, the site is bordered on the east by a row of oleanders, and on the south by several mature mioporum shrubs.

Table 1
Trees and Shrubs Found on SoCalGas Sites

NATIVE SPECIES		NONNATIVE SPECEIS	
Common Name	Scientific Name	Common Name	Scientific Name
Bishop pine	*Pinus muricata*	Benjamin fig	*Ficus Benjamina*
Blue elderberry	*Sambucus mexicana*	Bosnian pine	*Pinus leucodermis*
California redwood	*Sequoia sempervirens*	Brazillian peppertree	*Schinus terebinthifolius*
Canyon live oak	*Quercus chrysolepis*	Carrotwood	*Cupaniopsis anacardioides*
Coyote brush	*Baccharis pilularis*	Cootamundra Wattle	*Acacia baileyana*
		Cypress	*Chamaecyparis* sp.
		Eastern red cedar	*Junipers Virginian*
		Elm	*Ulmus* sp.
		Eucalyptus	*Eucalyptus globulus*
		Fig	*Ficus* sp.
		Ice plant	Family Aizoaceae
		Jade	*Crassula ovata*
		Japanese cedar	*Cryptomeria japonica*
		Kangaroo thorn	*Acacia paradoxa*
		Leyland cypress	*Cupressocyparis leylandii*
		Maackia	*Maackia chinensis*
		Mioporum	*Mioporum latum*
		Oleander	*Nerium oleander*
		Palm	Family Arecaceae
		Pampas grass	*Cortaderia selloana*
		Rhododendron	*Rhododendron arboreum*
		Smooth Arizona cypress	*Cupressus glabra*
		Trochodendron	*Trochodendron araliodes*
		Victorian box	*Pittosporum undulatum*
		White beam	*Sorbus* sp.

Lots 5, 6, 7 on Calabar Avenue Ground cover at this site consists of an area on the west (uphill) side that is mixed grass/iceplant (about 30 percent of the site), an area to the south that is mostly grass (20 percent), and a flat area (downhill) that is extremely disturbed and supports no vegetation. Several trees and shrubs are found at this site, including eucalyptus, Benjamin fig, agave, coyote brush, and trochodendron.

Lots 18, 19 on Calabar Avenue About 80 percent of the ground cover at this site consists of iceplant, both on the steep slope and the flat area below. In addition, several jade plants are found within the iceplant on the slope, and there are three eucalyptus trees that border the site to the north.

Lots 17-20 on 79th Street and Lots 82-85 on 83rd Street Ground cover across this site consists of approximately 30 percent grass nearly surrounded by larger areas of iceplant/ivy. Several nonnative trees are found on this site including carrotwood, Brazilian peppertree, and eucalyptus. Nonnative pampas grass is also found in several areas.

Lots 14-18 on 83rd Street and Lots 28-30 on Manchester Avenue Ground cover on this site consists of approximately 35 percent grass, 35 percent iceplant/grass, and 30 percent disturbed area where dumping has occurred. Several nonnative, large, and mature trees are found on this site, including fig, Bosnian pine, eastern red cedar, and cypress. A small native canyon live oak tree (less than 6 inches DBH) is found where the sire borders an apartment complex to the west. Shrubs on the site include pampas grass, jade, and cootamundra wattle.

Lot 11 on Saran Drive Ground cover on this site consists of approximately 25 percent grass and 75 percent iceplant mixed with another nonnative ground cover that produces yellow flowers. Several nonnative palm trees are found on the site, as well as fig trees. One large native canyon live oak is found

on this site, near Saran Drive. Nonnative shrubs on the site include oleanders, maackia, and kangaroo thorn.

Lots 6, 7 on 85th Street Ground cover on this site consists of approximately 85 percent grass and 15 percent landscaped gardening beds. Nonnative trees on the site include Leyland cypress and palms. Several California redwoods and Bishop pines are found on this site, species that are native to northern California. Shrubs on the site are nonnative and include rhododendron and white beam. A small canyon live oak (less than 6 inches DBH) is found on the east part of the site. Many ornamental plants are also found in the garden beds, such as irises and ferns.

Lots 14-16 on 83rd Street Ground cover on this site consists of approximately 70 percent grass, 20 percent iceplant, and 10 percent ivy. Trees on the site include the nonnative eucalyptus and smooth Arizona cypress. Shrubs include nonnative oleanders and Victorian box.

Lots 3, 4 on 82nd Street Ground cover on this site consists of approximately 90 percent grass with ornamental trees and shrubs along the northern and eastern borders. Trees are all nonnatives and include eucalyptus and Japanese cedar. Shrubs are nonnative and include mioporum and the oleanders that line the east side of the site.

Lot 6 on the corner of 81st Street and Berger Place Ground cover on this site consists of nearly 100 percent grass. One large native blue elderberry tree is located in the northwestern corner of the site, along with a nonnative fig tree. A small area of agave is present in the same area, but no other shrubs or trees are found on the site.

Lots 3, 4 on Speedway

Ground cover on this site consists of moderately sparse nonnative grasses, including pampas grass. No trees or ornamental plants are present on the site.

3.4 WILDLIFE

Very few wildlife species were detected during the surveys. Those detected and expected at the site are representative of the urban landscaping that covers the project sites. These sites are not expected to sustain native wildlife species because they are covered by nonnative and landscaping species.

No insects, fish, amphibians, reptiles or their sign were observed during the surveys and none are likely to inhabit the project site. Birds observed on the sites during the surveys included the American crow (*Corvus brachyrhynchos*), European starling (*Sturnus vulgaris*), and rock dove or domestic pigeon (*Columba livia*). Although many native bird species inhabit the Ballona wetlands near the site, they are unlikely to use the urban landscaped areas at the sites. Larger trees on the project sites may provide nesting habitat for local species.

No native mammal species were detected during the surveys, other than domestic dogs (*Canis familiaris*) and cats (*Felis domesticus*). Mammals that may inhabit the sites included the black and Norway rat (*Rattus rattus* and *R. norvegicus*) and the house mouse (*Mus musculus*).

3.5 SENSITIVE SPECIES

No federally or state listed or proposed endangered or threatened species were observed on the project sites during the surveys, and none are likely to inhabit the sites. Although at least 20 endangered and threatened species utilize or have utilized the Ballona wetlands, none of these are likely to inhabit any of the project sites. The project sites are landscaped with nonnative species with none of those habitats that support sensitive species in the Ballona wetlands. The project sites provide little or no biological value to those species that may be found in the Ballona wetlands.

Table 2 lists all species found in data searches for the region, their status (federal, state, and CNPS or other special status), and their potential for occurrence on the project site. Descriptive text of those species with a potential for occurrence determined to be moderate or high is provided below.

The burrowing owl is a federal species of concern (FSOC) and California species of special concern (CSC) found throughout much of southern and central California and has been observed within five miles of the project sites. This species often inhabits open areas with low-growing shrubs and has been observed in areas at the edge of cities. This species is also of special interest to the California Burrowing Owl Consortium. The less-disturbed project sites may support this species, especially in areas adjacent to open space, such as the sites along Calabar Avenue and 79th Street.

Table 2
Sensitive Species in the Project Area

Scientific Name Common Name	Status	PFO	Comments
PLANTS			
Astragalus pycnostachyus var. *lanosissimus* Ventura marsh milkvetch	Federal: PE State: none CNPS: 1A	L	Found in coastal salt marsh. This community is not found on or adjacent to the project sites.
Chorizanthe parryi var. *fernandina* San Fernando Valley spineflower	Federal: FSOC State: none CNPS: 1A	L	Formerly found in coastal scrub on sandy soils, now probably extinct. Habitat for this species is not found on or adjacent to the project sites.
Dithyrea maritima Beach spectaclepod	Federal: FSOC State: T CNPS: 1B	L	Found in coastal dunes and coastal scrub near the shore at very low elevations (10-150 feet). Habitat for this species is not found on or adjacent to the project sites.
Hemizonia parryi var. *australis* Southern tarplant	Federal: FSOC State: none CNPS: 1B	L	Found on the margins of marshes and swamps, in vernal pools, and in valley and foothill grasslands. Habitat for this species is not found on or adjacent to the project sites.
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	Federal: FSOC State: none CNPS: 1B	L	Found in coastal salt marshes, playas, foothill grasslands, and vernal pools. Habitat for this species is not found on or adjacent to the project sites.
Phacelia stellaris Brand's phacelia	Federal: none State: none CNPS: 1B	L	Found in open areas of coastal scrub and coastal dunes. Habitat for this species is not found on or adjacent to the project sites.
Potentilla multijuga Ballona cinquefoil	Federal: FSOC State: none CNPS: 1A	L	Formerly found in brackish meadows and seeps of Los Angeles County, now probably extinct. Habitat for this species is not found on or adjacent to the project sites.
WILDLIFE			
Cicindela hirticollis gravida Sandy beach tiger beetle	Federal: FSOC State: none	L	Found in areas of clean light-colored sand adjacent to non-brackish water along the coast. Habitat for this species is not found on or adjacent to the project sites.
Coelus globulus Globose dune beetle	Federal: FSOC State: none	L	Found on coastal sand dunes, often beneath dune vegetation. Habitat for this species is not found on or adjacent to the project sites.
Eucosma henneii Henne's eucosman moth	Federal: FSOC State: none	L	Found only at El Segundo Dunes.
Euphilotes battoides allyni El Segundo blue butterfly	Federal: E State: none	L	Found in remnant coastal dune habitats not present on or adjacent to the project sites.
Onychobaris langei Lange's El Segundo dune weevil	Federal: FSOC State: none	L	Found only at El Segundo Dunes.

Scientific Name Common Name	Status	PFO	Comments
Panoquina errans Wandering (saltmarsh) skipper	Federal: FSOC State: none	L	Found in coastal salt marshes. Habitat for this species is not found on or adjacent to the project sites.
Trionoscuta dorothea dorothea Dorothy's El Segundo dune weevil	Federal: FSOC State: CSC	L	Found on coastal sand dunes in Los Angeles County. Habitat for this species is not found on or adjacent to the project sites.
Tryonia imitator California brackishwater snail	Federal: FSOC State: none	L	Found in permanently submerged areas of coastal lagoons, estuaries, and salt marshes. Habitat for this species is not found on or adjacent to the project sites.
Clemmys marmorata pallida Southwestern pond turtle	Federal: FSOC State: CSC	L	Found in permanent bodies of water below 6000 feet in elevation. Habitat for this species is not found on or adjacent to the project sites.
Athene cunicularia Burrowing owl (burrow sites)	Federal: FSOC State: CSC	M	Found in open dry desert, scrubland, and grassland communities.
Charadrius alexandrinus nivosus Western snowy plover (nesting)	Federal: T State: CSC	L	Found on sandy beaches, salt pond levees, and shores of large alkali lakes. Habitat for this species is not found on or adjacent to the project sites.
Laterallus jamaicensis coturniculus California black rail	Federal: FSOC State: T	L	Found in dense pickleweed areas of salt marshes that are adjacent to large bays. Habitat for this species is not found on or adjacent to the project sites.
Passerculus sandwichensis beldingi Belding's savannah sparrow	Federal: FSOC State: E	L	Found in coastal tidal salt marshes. Habitat for this species is not found on or adjacent to the project sites.
Polioptila californica californica Coastal California gnatcatcher	Federal: T State: CSC	L	Found only in coastal sage scrub below 2500 feet in elevation. Habitat for this species is not found on or adjacent to the project sites.
Sterna antillarum browni California least tern (nesting colony)	Federal: E State: E	L	Nests in colonies on flat coastal areas with little or no vegetation. Habitat for this species is not found on or adjacent to the project sites.
Perognathus longimembris pacificus Pacific pocket mouse	Federal: E State: CSC	L	Found in coastal plains with fine alluvial sands near the ocean. Habitat for this species is not found on or adjacent to the project sites.

Status Codes

Federal
E = Endangered
PE = Proposed Endangered
T = Threatened
FSOC = Federal Species of Concern

State
E = Endangered
T = Threatened
CSC = California Species of Special Concern

CNPS
1A = Plants presumed extinct in California
1B = Plants rare, threatened, or endangered in California and elsewhere

Potential for Occurrence (PFO)

L = **Low Potential for Occurrence** - No present or historical records cite the species' occurrence in or near the survey area, and the habitats strongly associated with the species do not occur in or near the vicinity.

M = **Moderate Potential for Occurrence** - Either a historical record exists of the species in or near the survey area, or the habitats associated with the species occur in or near the survey vicinity.

H = **High Potential for Occurrence** - A historical record cites the species in or near the survey area, and the habitats strongly associated with the species occur in or near the survey vicinity.

P = **Species present** - The species was observed in the project area at the time of the survey.

SECTION 4.0 - PROJECT IMPACT ANALYSIS

Significance Determination and Definition of Direct, Indirect, and Cumulative Impacts

In this section, direct and indirect impacts are presented for biological resources, including physical characteristics, sensitive habitats and jurisdictional waters, vegetation communities, wildlife, and sensitive species. Direct impacts are those which affect the resource immediately, such as the removal of vegetation for staging areas or construction. Indirect impacts include those that result from the project but are not immediate affects, such as erosion created by the removal of vegetation. Cumulative impacts are the result of two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts (CEQA Guideline section 15355).

Impacts to plants and wildlife are considered significant if one or more of the following criteria are met with the implementation of the proposed project:

1. Any loss of individuals or populations of a listed or proposed endangered or threatened species or its habitat;

2. Any loss of critical habitat and/or declining wildlife habitat sensitive or rare to the project region (i.e. riparian woodlands, wetlands, cliff face formations, surface water);

3. Substantial loss of populations or habitat of a federal species of concern (FSOC), California Species of Special Concern (CSC), or otherwise regionally rare or sensitive species that could jeopardize the continued existence of that species in the project region;

4. Substantial loss or long-term disruption of a major wildlife movement corridor;

5. Loss of at least five percent of undisturbed habitats within a biogeographic region such as that found in a single valley, mountain range, or coastline;

6. Substantial loss of natural vegetation communities that are slow to recover; or

7. Substantial loss of native plant or animal species diversity, or natural vegetation community diversity.

Direct impacts are defined as those that affect biological resources directly, such as vegetation removed by grading. Indirect impacts are those which occur as a result of the project, but are not directly related to project activities, such as the reduction in wildlife at a site as a result of the loss of vegetation removed by grading.

4.1 PHYSICAL CHARACTERISTICS

The proposed project (the sale of the properties) will not change the existing land uses or the zoning of the sites, and no significant impacts are expected to adjacent land uses. No significant impacts are expected to topography or soils from the proposed project. If these sites are developed in the future, small changes in the grade or elevation of the sites may result and non-native materials could be used in construction. These changes would not significantly alter the existing condition of the area, which is already an area that is highly disturbed from past development.

4.2 SENSITIVE HABITATS AND JURISDICTIONAL WATERS

No wildlife movement corridors are present on any of the sites and no long-term significant impacts are expected to local and/or regional wildlife movement corridors as a result of the proposed project. The proposed project (the sale of the lots) would not adversely effect the ecological connectivity of the

El Segundo dune ecosystem and the Ballona wetlands. Nor would adverse effects occur if the sites were developed within their current zoning because these sites do not provide habitat that could be used as a wildlife movement corridor. No jurisdictional waters are present on the sites and no impacts to jurisdictional waters are expected from the proposed project.

4.3 VEGETATION COMMUNITIES

No significant impacts to vegetation communities are expected as a result of the proposed project. The proposed project (the sale of the lots) would not alter the existing condition of the sites. If the sites were developed in the future, two sites support trees that fall under the jurisdiction of City and/or County tree ordinances:

- The site on Saran Drive (Lot 11) supports a large canyon live oak that would fall under the jurisdiction of both the City's Oak Tree Preservation Ordinance and the County's Woodland or Protected Tree Ordinance.

- The site at the corner of 81st Street and Berger Place supports a large blue elderberry tree that may fall under the new County Woodland or Protected Tree Ordinance.

If the future project proponent were to propose the disturbance or removal of these trees, a permit (or permits) would be required prior to such activities.

4.4 WILDLIFE

No significant impacts are expected to wildlife as a result of the proposed project. The proposed project (the sale of the properties) would not alter the existing condition of the sites. If these sites are developed, no significant impacts are expected to wildlife because these sites are covered by nonnative vegetation and are of limited value for native wildlife species.

4.5 SENSITIVE SPECIES

No significant impacts are expected to sensitive plants or wildlife as a result of the proposed project. None of these species are likely to inhabit the sites and the proposed project (the sale of the properties) would not alter the existing condition of the sites. If these sites are developed, no significant impacts are expected to sensitive because these sites are covered by nonnative vegetation and are of limited value for native species.

Small numbers of burrowing owls may inhabit "fringe" areas of sites along Calabar Avenue and 79th Street- adjacent to undisturbed areas. The proposed project (the sale of the properties) is unlikely to adversely affect any owls that may be on these sites. If these properties are later developed, construction activities and associated noise levels could adversely affect these owls by displacing them from the sites and adjacent areas. This impact is not expected to be significant because (1) adjacent areas near the cliffs and nearby areas of the Ballona wetlands could provide habitat for these owls, (2) the burrowing owl is not a listed endangered or threatened species, and (3) if any owls are disturbed, the number would be extremely small due to the disturbed nature of the sites.

4.6 CUMULATIVE IMPACTS

No cumulative impact is expected as a result of the proposed project. The proposed project is simply the sale of the lots. In addition, future development of these sites would not likely create significant cumulative impacts to biological resources because these sites are already of a highly disturbed urban nature, covered by nonnative landscaping.

SECTION 5.0 - MITIGATION AND MONITORING REQUIREMENTS

5.1 MITIGATION

No mitigation is required for this project because no significant impacts are expected.

5.2 MONITORING

No monitoring is required or recommended for the proposed project.

SECTION 6.0 - LIST OF PREPARERS

A multidisciplinary team of biologists performed the biological resources surveys and assessed the habitat within the project site. The following Chambers Group personnel were responsible for conducting surveys, analyzing data, and preparing this report:

- Kathryn Buescher, Senior Wildlife Biologist
- Pam DeVries, Senior Botanist
- Dawn Durand, Word Processor
- Ken McDonald, Staff Botanist
- Don Mitchell, Director of Terrestrial Ecology
- Anthony Rivera, Production Manager

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APPENDIX E

HUMAN HEALTH RISK ASSESSMENT

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Southern California Gas Company
Playa del Rey Gas Storage Facility

April 2004

Prepared for:

California Public Utilities Commission

Under contract to
Environmental Science Associates

Prepared by:

BROWN AND CALDWELL
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Irvine, California 92602

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EXECUTIVE SUMMARY

This report presents a human health risk assessment (risk assessment) for chemicals found in samples of environmental media (soil, soil vapor and groundwater) at 36 lots of land that are a part of Southern California Gas Company's (SCG) Playa del Rey Gas Storage facility. SCG has requested that the California Public Utilities Commission (CPUC) authorize the sale of these lots. The lots were historically used for oil production, and more recently in gas storage reservoir operations. This risk assessment is part of a series of investigations and reports by the Environmental Science Associate's team as a result of SCG's filing an application (A) No. 09-05-029 seeking CPUC authority under Public Utilities Code Section 851 to sell the 36 lots. The CPUC oversees the divestiture of utility properties to assure that they are suitable for transfer.

This risk assessment evaluates the potential human health risks associated with chemicals detected in the studies conducted by Brown and Caldwell in 2003. Human health risk assessment is a formal process that combines information on how people could come into contact with chemicals (exposure) with information on the health effects of the chemicals (toxicity) into estimates of the likelihood that an adverse health effect could occur. Risk assessment does not predict actual health effects but is a tool to determine whether mitigation measures are warranted if the CPUC approves the proposed sale.

In summary, the results for the 36 lots in Playa and Marina del Rey indicate that the total cancer risk for all types of exposure to a resident, assuming 30-year exposure to the maximum chemical concentration found in any sample at any lot, is 4×10^{-7} (four in 10 million risk level). This risk level is less than one half the lowest level of no-significant risk of 1×10^{-6} (one in a million risk level) set by California Environmental Protection Agency (Cal/EPA) and U.S. Environmental Protection Agency (U.S. EPA). Cal/EPA and U.S. EPA have established a range of acceptable cancer risks of 1×10^{-4} to 1×10^{-6} for Superfund Sites. This means that the acceptable target risk range for cancer risk levels is between an upper limit of 1 in 10,000 probability to a de minimis level of 1 in 1,000,000.

Based on the results for the Playa and Marina del Rey sites, an individual who is exposed for 30 years as a child and adult will have an increased probability of incidence of cancer of 0.0000004 over their baseline risk. An individual's baseline risk of contracting cancer over a lifetime in the United States is about 0.25. Therefore, this exposure will not increase their probability of risk significantly (0.2500004). Figure ES-1 shows the total cancer risk as well as the risk from individual exposure pathways. The total noncancer hazard index for all chemicals and all types of exposure is 0.6 which is well below the level of 1.0 considered safe for lifetime exposure by U.S. EPA and Cal/EPA for children.

Although these results indicate that conditions are safe for unrestricted use, mitigation measures are recommended for the Environmental Impact Report because the model that both the U.S. EPA and Cal/EPA use (the only model for vapor intrusion) is controversial and scientists are not in agreement that vapor migration is sufficiently understood to rely on model results. Mitigation measures for vapor intrusion could include institutional controls (such as deed restrictions) or engineered controls (such as vapor barriers) such as required by the Los Angeles City Building Code Section 91.106.4.1 and Division 71 of Article 1, Chapter IX of the Los Angeles Municipal Code. This code requires mitigations for methane and other gases be implemented when future

construction occurs. These measures include the installation of vapor membrane barriers and vent piping as well as trench dams and electrical seal offs for each of these sites.

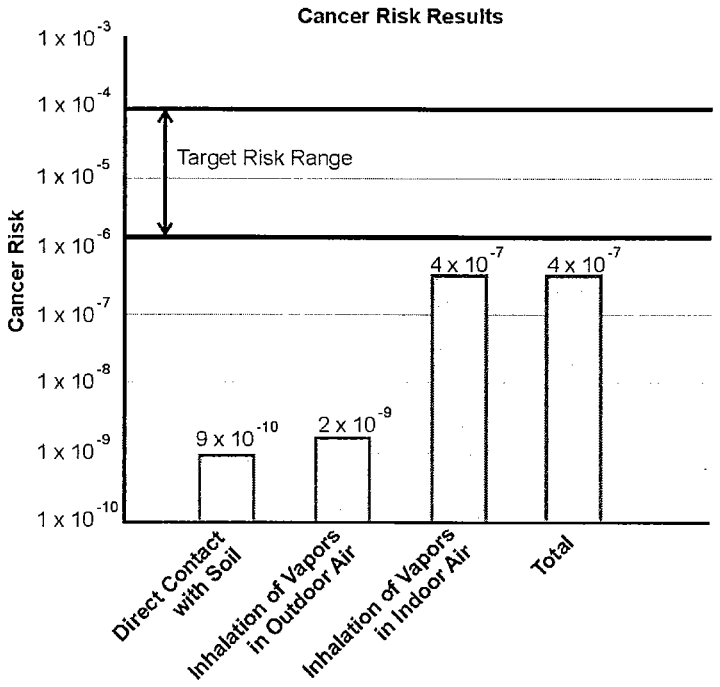

Figure ES-1. Comparison Site Risk to Target Risk Range

The following is a brief summary of the steps used in the risk assessment:

- **Data Evaluation** – presents the analytical data that will be used in the risk assessment. The sample locations were selected in an iterative fashion to assure that the samples were collected in areas most likely to be impacted and closest to any abandoned oil wells. The samples collected were analyzed for total petroleum hydrocarbon (TPH), volatile organic chemicals (benzene, toluene, ethylbenzene, and xylene) and semivolatile organic chemicals. The laboratory results for these chemicals include 86 soil samples (48 from depths 15 feet or less), 231 soil vapor samples and 21 groundwater samples.

  Methane and **hydrogen sulfide** are two gases that were sampled for in the investigations but not included in this human health risk assessment. Both of these gases are evaluated in separate reports. At this time, there is no evidence that hydrogen sulfide in outdoor air is elevated due to releases from the vapors at the property clusters. And therefore, hydrogen sulfide was not included in the risk assessment. Methane is not included in this risk assessment because the primary effects are as an asphyxiant (replaces oxygen) and explosive at high concentrations. A separate evaluation was conducted to evaluate the risks associated with high concentrations of methane. Methane was not included in this risk assessment for

lifetime exposure because concentrations below the levels of concern as an asphyxiant or explosive are not known to have long term health effects.

- **Exposure Assessment** – calculates the amount of chemicals that people could potentially take in if they were exposed to chemicals (daily intake). In summary, the most likely ways that people could come into contact with chemicals (exposure pathways) include inhalation of chemical vapors that have migrated into indoor or outdoor air from soil, groundwater or underground storage units, ingestion of chemicals in soil, inhalation of chemicals on particles of soil and absorption of chemicals from soil on their skin.

  This risk assessment used the maximum concentration of chemicals detected in any sample on any lot to calculate the highest potential exposure. U.S. EPA and Cal/EPA protocols use a lower average concentration. In addition, the exposure assumptions used to calculate daily intake rates are designed to be higher than is reasonably likely to occur, so that if any exposure does occur, it is expected to generally be less than these estimates. These assumptions describe a hypothetical resident adult and child who are assumed to be in contact with the chemicals for 350 days a year for 30 years, 6 years as a child and 24 years as an adult at the maximum concentration.

- **Toxicity Assessment** – presents the toxicity factors that, combined with the daily intake from the exposure assessment, are used to calculate the risk. The health effects are grouped into potential carcinogenic effects and noncarcinogenic health effects, e.g., liver damage. Benzene is the only chemical identified that is considered to be a known human carcinogen. The other chemicals are only known to have noncarcinogenic health effects. Cancer risk and noncancer hazard are both evaluated in this risk assessment.

- **Risk Characterization** – combines the daily intake from the exposure assessment and toxicity factors to evaluate the potential for adverse health effects. The potential health risks are estimated for both carcinogenic and noncarcinogenic health effects. The results are presented in the opening portions of this summary.

- **Uncertainty Analysis** – identifies sources of uncertainty considered in the risk assessment analysis and discusses the level of confidence that can be placed in the findings. There is uncertainty in any risk assessment due to natural variability, e.g. people do not breathe at the same rate, and scientific assumptions, e.g. toxicity data is largely based on tests with animals. To compensate for this variability, every effort is made to represent worst case conditions. For example, sample locations were biased to areas of known or suspected impacts. The maximum concentration found in any sample was used to create a hypothetical worst-case location for exposure. In addition, U.S. EPA and Cal/EPA assumptions for how long exposure could occur or how toxic a chemical might be are designed represent reasonable maximum conditions. These efforts increase the level of confidence that the risk assessment findings are reliable.

  As noted earlier, this risk assessment recommends mitigation measures such as required by Los Angeles City Building Code Section 91.106.4.1 and Division 71 of Article 1, Chapter IX of the Los Angeles Municipal Code in light of the controversy surrounding modeling of vapor intrusion.

1.0 INTRODUCTION

This report presents a human health risk assessment for chemicals found in samples of environmental media (soil and soil vapor) at 36 lots of land that were once part of SCG's Playa del Rey Gas Storage facility. These undeveloped lots are located in residential neighborhoods of Playa del Rey (34 lots) and Marina del Rey (2 lots) within the City and County of Los Angeles. The lots were historically used for oil production, and more recently for gas storage reservoir operations.

On May 12, 1999, SCG submitted Property Divestiture 851 Application (Number 99-05-029) to the CPUC seeking approval of the sale of the lots by the CPUC. In 2003, CPUC hired Environmental Science Associates (ESA) and Brown and Caldwell to perform environmental impact reports and investigations of the lots, including the preparation of this risk assessment. The results of the environmental assessment studies are documented in a Report on the Results of Environmental Site Assessment Activities published under a separate cover (Brown and Caldwell 2004).

This risk assessment evaluates the potential human health risks associated with chemicals detected in the 2003 studies conducted by Brown and Caldwell. Human health risk assessment is a formal process that combines information on how people could come into contact with chemicals (exposure) with information on the health effects of the chemicals (toxicity) into estimates of the likelihood that an adverse health effect could occur. The risk assessment was prepared in accordance with Cal/EPA and U.S. EPA guidances' including, but not limited to, "Preliminary Endangerment Assessment Guidance" (Cal/EPA 1994), "Risk Assessment Guidance for Superfund (RAGS), Volume 1, Human Health Evaluation Manual," (U.S. EPA 1989), U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) (U.S. EPA 2002), as well as additional guidances' listed in the references. The risk assessment was prepared using the following six steps:

1. **Introduction** – provides a summary of how the risk assessment was prepared, a background on the proposed CPUC Divestiture Project, descriptions of the sites and the investigation process used to collect samples of environmental media.

2. **Data Evaluation** – includes an evaluation and summary of the analytical data, and discusses the chemicals that were identified in the environmental media.

3. **Exposure Assessment** – identifies activities that bring people into contact with chemicals and estimates the chemical concentrations to which people could be exposed.

4. **Toxicity Assessment** – discusses the toxicological properties and potential health effects of the chemicals of potential concern.

5. **Risk Characterization** – combines the exposure and toxicity information to evaluate the potential for adverse health effects. The potential health risks are estimated for both carcinogenic and noncarcinogenic health effects.

6. **Uncertainty** – identifies sources of uncertainty in the risk assessment and discusses the level of confidence that can be placed in the findings.

Figure 1-1 shows the relationship between the four key risk assessment steps.

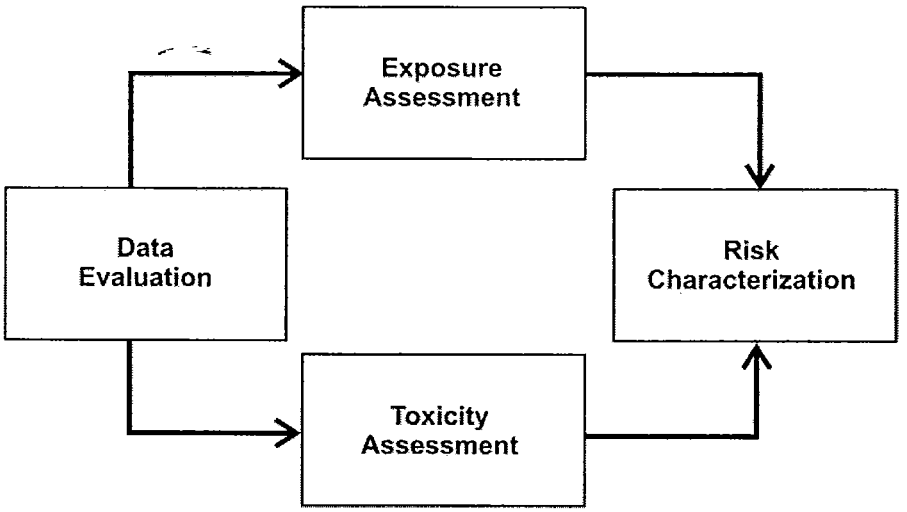

Figure 1-1. Risk Assessment Steps

In summary, the findings indicate that the potential for cancer risk or noncancer hazard health effects, if any exist, would be well below levels considered insignificant by state and federal agencies for all chemicals detected in any sample and at any location. However, to address one of the most important sources of uncertainty, this risk assessment recommends that mitigation measures such as required by Los Angeles City Building Code Section 91.106.4.1 and Division 71 of Article 1, Chapter IX of the Los Angeles Municipal Code for methane and other gases be implemented when future construction occurs at these sites. These measures include the installation of vapor membrane barriers and vent piping as well as trench dams and electrical seal offs.

1.1 Site History

The 36 lots are located approximately 1.5 miles north of Los Angeles International Airport in Playa del Rey and Marina del Rey, California. Figure 1.1.1 is a topographic map depicting the general location. Thirty four lots in Playa del Rey are grouped into 11 property clusters of adjacent lots. There is also one cluster containing 2 lots in Marina del Rey. Figure 1.1.2 shows the locations of the 11 property clusters in the Playa del Rey area. The two lots in the Marina del Rey cluster are shown on Figure 1.1.3.

The following is a summary of the general history of the oil and gas activities on the lots that was provided by SCG. The 11 oil and gas wells at the property clusters located in Playa del Rey were drilled in 1935-1936 to produce crude oil. Eight of the Playa del Rey oil wells were abandoned between 1936 and 1942. Oil well abandonment is regulated by the California Division of Oil, Gas and Geothermal Resources (DOGGR). Well abandonment involves measures that will prevent migration of fluids or gas to the surface including measures such as filling the casing of the well with cement at specific intervals and mud. There is also an inspection of cement plugs by the Division of Oil, Gas and Geothermal Resources after completion of the abandonment. The remaining 3 Playa del Rey wells were not abandoned in these early years and produced oil and gas during this period.

Six wells were re-drilled in 1955-1956 by SCG for use in their storage operations. The other two wells were re-abandoned in 1956 and 1958 to standards current at that time, and were never used in the SCG gas storage operations. The nine Playa del Rey wells used by SCG in their gas storage operations were primarily used as observation and fluid removal wells. When it was determined that they were not vital to the storage reservoir's operation, all the remaining wells were abandoned with DOGGR oversight in 1992-1995.

In 1942, the United States government had over 240 acres of the Playa del Rey oilfield converted to use as a natural gas storage field during World War II (ESA 2003). The natural gas storage field encompassed the 11 property clusters in Playa del Rey. After the war, in 1945, the storage field was transferred to the Reconstruction Finance Corporation which in turn sold the storage field in 1953 to SCG. In 1956, following construction of facilities for the Playa del Rey Natural Gas Storage Field, the injection and storage of natural gas in a zone about 6,200 feet below ground surface began. Today, SCG continues to inject, remove and store nature gas at the Playa del Rey Natural Gas Storage Field but no longer uses the 11 Playa del Rey wells that are a part of this Site in these operations.

The natural gas stored in the below-ground reservoir is brought in by pipeline from other gas production fields and is used as a "supply cushion" to provide extra natural gas to consumers during times of peak demand. Impermeable layers of rock provide a natural cap to the gas storage field. SCG used the oil wells in the Playa del Rey area as portals into the underground storage field to inject and remove the natural gas, to monitor the reservoir and its pressure, to remove oil and water from the storage reservoir, and to monitor for leakage outside the reservoir area. In 1955-1956, SCG opened up 6 of the eight previously abandoned Playa del Rey wells for use in their storage operations. Two of these wells were re-abandoned in 1956 and 1958 to standards current at that time, and were never used in the SCG gas storage operations. The Playa del Rey wells used by SCG in their gas storage operations were primarily used as observation and fluids removal wells. When it was determined that they were not vital to the storage reservoir's operation, they were abandoned with DOGGR oversight in 1992-1995.

The well located in Marina del Rey (Troxel-1) was drilled in 1930 and produced oil from that time until 1993. It was not a part of the Playa del Rey Natural Gas Storage field, but was acquired to monitor natural gas migration to the north, according to SCG internal correspondence. At the time of its abandonment in 1993, it was still producing gas and crude oil, reportedly from a different zone than that use for the storage reservoir. The well was re-abandoned in 1994 with DOGGR oversight and approval after natural gas was detected in the area of the well.

1.2 Site Investigation and Data Collection

In 2003, Brown and Caldwell conducted an environmental assessment to evaluate the presence of petroleum hydrocarbons in soil and soil vapor at all 12 lots and also the shallow groundwater at Cluster 12, Troxel. The results of this environmental assessment are documented in Brown and Caldwell's *Report on the Results of Environmental Site Assessment Activities* which was submitted to the CPUC under a separate cover (Brown and Caldwell 2004). This report and others created in preparation of the Environmental Impact Report are available from the CPUC upon written request.

The purpose of the studies was to collect samples of soil, soil vapor and groundwater for analysis for TPH and chemicals of most concern to human health: benzene, ethylbenzene, toluene and xylenes and semivolatile organic chemicals that can be found in TPH. The sample locations were selected based on likelihood of the presence of impacted soil, soil vapor or groundwater. The study was conducted in three phases of gathering data to assure that the samples would be representative of the "worst-case" areas of impact. The results of one phase were used to focus the sampling for the next phase in areas where the highest concentrations were found. The phases of the assessment activities carried out were:

Phase	Scope of Phase
Phase I: June 2003	Soil vapor samples were collected from 133 locations (a minimum of 4 from each of the 36 lots) from depths of 5 to 10 feet. Each location was tested only once and is called the temporary soil vapor sampling location in this risk assessment. Temporary soil vapor sampling points can only be sampled one time. The purpose was to use the results of the temporary sampling points to locate the permanent soil vapor sampling points in Phase 2 in the locations of highest impact. However, the information from these temporary soil vapor sampling locations was also included in the risk assessment.
Phase II: July 2003	Playa del Rey Property Clusters: a) Soil samples were collected every 5 feet from 34 locations to depths of 30 feet below grade from borings made with a hollow-stem auger in the 11 property clusters. b) Soil samples were collected from one 80-foot soil boring to assess deeper soil physical and chemical properties. c) Fourteen soil vapor monitoring points were installed, with at least one for each cluster. d) Select soil samples were submitted from each borehole for both geotechnical and chemical analyses. Marina del Rey Property Cluster: a) Soil samples were collected every 5 feet at five locations by boring into the soil using hollow-stem auger drilling methods (with continuous coring from 25 to 35 feet). b) Five groundwater wells were installed by converting four borings to 20 foot depth and a 45-foot boring were converted to groundwater monitoring wells. c) A semi-permanent soil vapor well was installed in one additional soil boring hand-augered to approximately 8 feet bgs. d) Soil samples were collected from one deep (60 feet) soil boring made using mud rotary drilling techniques to assess deeper soil physical and chemical properties. e) Select soil samples were submitted from each boring location for both geotechnical and chemical analysis.
Phase III: August through December 2003	Four soil vapor sampling events were conducted at select well locations (12 plus one additional for the nested well at Cluster 11) from the 14 semi-permanent soil vapor monitoring points. At each event, at least one vapor well was monitored from each property cluster, and the selected well was the one closest to the former oil well. Four groundwater sampling events were conducted at the monitoring wells at the Marina del Rey property cluster.

The laboratory data for all samples from the investigation are included in Appendix A. Each sample (soil vapor or soil) was given a unique designation code that was recorded in the field logbook, on the sample/core log, on the label affixed to the sample container, and on the chain-of-custody record. For soil vapor and soil samples, the first set of characters represented the cluster identification, the next set identified the lot number, the following set denoted the soil vapor or boring number, and the last set of characters was the sample depth interval in the boring in feet bgs. An example of a sample designation is as follows:

C1-L1-SG1-10	where	C1	= Cluster 1
		L1	= Lot 1
		SG1	= Soil Gas Probe 1
		10	= 10-foot sample interval depth (feet below grade)

2.0 DATA EVALUATION

In the Data Evaluation, the results from laboratory analysis (data) of concentrations of chemicals identified in environmental media (groundwater, soil and soil vapor) samples are reviewed to develop a list of chemicals identified in the samples. These chemicals are all included in the risk assessment calculations and are called chemicals of potential concern. In the next section, Exposure Assessment, the data on concentrations of chemicals in environmental media are converted into estimated exposure concentrations with which people could come into contact.

The historic uses of all the lots involved oil and natural gas production and storage. The samples collected were analyzed to determine the presence of TPH, the volatile organic chemicals (with benzene, toluene, ethylbenzene, and xylenes being the only volatile organic chemicals detected) and semi-volatile organic chemicals.

Methane and hydrogen sulfide are two gases that are included in investigations conducted by other members of the ESA team that are not included in the human health risk assessment as mentioned on page 2. However, the reports that address methane from Methane Specialists and hydrogen sulfide from Gary Boettcher were prepared along with this risk assessment as part of the Environmental Impact Report. These reports are listed in the references and are available from the CPUC upon written request.

Hydrogen sulfide was not included in the risk assessment because there is no evidence that hydrogen sulfide in outdoor air is elevated due to releases from the vapors at the lots. This evidence is documented in a report by Gary Boettcher (Boettcher 2004).
Methane is not included because it is not known to have long term health effects below the concentrations where it acts as an asphyxiant (replaces oxygen) and is explosive. The latter hazards associated with methane are discussed separately in a report prepared by Methane Specialists, another member of the ESA team (Methane Specialists 2004).

The data were evaluated to determine if any samples or data points might not be usable for risk assessment calculations. Risk assessment protocols acknowledge that some data that meet the standards required for validation of laboratory and field methods may not be suitable for the risk assessment. The usability of the data was evaluated based on the presence of elevated detection

limits, laboratory data qualifiers and the detection of any chemical in the associated sample blanks in accordance with U.S. EPA guidance (U.S. EPA 1989).

The data collected during the recent investigation are presented in Appendix A and were found to be usable in the risk assessment. There were no issues with data quality.

2.1 Soil Samples

The sample results used in the risk assessment include 86 soil samples (48 of which were collected from depths of 15 feet or less below ground surface) (Appendix A). Duplicate samples are included in this count. TPH was analyzed by molecular weight groupings. Figures 2.1.1 and 2.1.2 depict the locations and results of all soil samples in which any of the chemicals were detected for the Playa del Rey and Marina del Rey property clusters, respectively. The figures only present the results for samples where at least one chemical was detected. There are many more samples than represented on these figures. Hydrocarbons were detected in 16 of the 48 0 to 15 foot-depth samples. As explained in Section 3.0, the zone from the surface to 15 foot-depth is the mostly likely exposure depth. Additional information on the groupings and the nature of these hydrocarbon chemicals is presented in Section 3.1. In the soil samples, gasoline was not identified in any sample nor was the individual components of gasoline (benzene, ethylbenzene, toluene and xylene). There were five samples analyzed for semivolatile organic chemicals but none were identified.

2.2 Temporary and Semi-Permanent Soil Vapor Samples

The sample results used in the risk assessment include 175 samples from temporary vapor sampling locations conducted during the first phase of the Brown and Caldwell investigation (Appendix A) and 56 samples from 12 semi-permanent vapor monitoring wells (one of which has 2 sample depths) conducted during the third phase of the Brown and Caldwell investigation. Duplicate samples are included in this count.

The first phase of Brown and Caldwell's work included testing soil gas from 132 different locations on the property clusters. The results of detected samples from the temporary soil vapor survey are mapped on Figure 2.2.1 and Figure 2.2.2 for the Playa del Rey and Marina del Rey property clusters, respectively. In the temporary vapor sampling locations, benzene was not identified in any sample. The other chemicals, ethyl benzene, toluene, xylene and TPH as gasoline, were identified in a frequency ranging from two to 11 percent (20 samples). An exception to the number of analyses is xylene. Total xylenes includes the ortho, meta and para forms. There were 14 samples for total xylenes and 56 samples for two groupings of the forms, meta and para-xylenes (m,p xylene) and ortho-xylene (o-xylene). Duplicate samples are included. No chemicals were detected in the Marina del Rey property cluster.
The third phase of Brown and Caldwell's site investigation included the sampling of semi-permanent soil vapor monitoring points installed at each of the property clusters. Four rounds of sampling were conducted over 4 months during periods of varying temperature and pressure. The results of detected soil gas samples from the semi permanent monitoring wells are presented in Figures 2.2.3 and 2.2.4, for the Playa del Rey and Marina del Rey property clusters, respectively. In the permanent vapor sampling locations, all chemicals included in the analyses were identified in one or more samples with a frequency ranging from nine percent for benzene to 80 percent for toluene.

2.3 Groundwater

There are 21 samples of groundwater from five wells at Cluster 12, Troxel in Marina del Rey. Benzene, ethylbenzene, toluene, xylenes or TPH as gasoline were detected in most of the samples and the results are shown on Figure 2.3.1 and are tabulated in Appendix A.

3.0 EXPOSURE ASSESSMENT

The exposure assessment discusses the properties of the chemicals, identifies the activities that could bring people into contact with the chemicals (exposure scenarios), the concentration at the point of exposure and how much chemical they could take in (daily intake). Risk assessment methods are designed to estimate a reasonable maximum exposure over the lifetime to individuals who could live at the site.

3.1 Properties of Petroleum Chemicals

The ways that people could be exposed to chemicals depends on their chemical properties. The components of oil are called petroleum hydrocarbons. Petroleum hydrocarbons are complex mixtures of chemicals that range from chemicals like benzene that are light-weight chemicals with six carbons in the benzene ring up to complex heavier-weight chemicals with 36 to 40 carbons in the molecules. TPH is analyzed by molecular weight groupings: C6-C10 means the chemicals have six to 10 carbon atoms; C10–C22 means the chemicals have 10 to 22 carbon atoms and C22-C36 means the chemicals have 22 to 36 carbon atoms.

The molecular weight of the chemical can be use to predict how the chemical will behave in the environment. The lighter-weight chemicals from C6-C10 also include benzene, ethylbenzene, toluene and xylenes. These chemicals, collectively called BTEX, are volatile and evaporate easily into pores in the soil as soil vapor and then can migrate into indoor or outdoor air under some circumstances. These chemicals can be degraded by natural soil bacteria and often, the concentrations will be reduced or eliminated as the soil vapors migrate upwards. The heavier components of TPH can persist in soil and remain immobile in the soil or leach into the groundwater.

The understanding of vapor migration is a newly emerging risk assessment issue and is still controversial among scientists. Scientists do not agree on the circumstances under which vapors will migrate or on the natural processes in soil that could reduce the concentrations of chemicals in the soil vapor. For purposes of this risk assessment, the chemical vapors are assumed to migrate into indoor and outdoor air without any natural degradation processes reducing the concentration.

3.2 Exposure Scenarios

This section identifies the types of activities that could bring people into contact with the chemicals (exposure scenarios). An exposure scenario includes people who could come into contact with the chemicals (receptors) from their activities. All of the lots are vacant at this time. The lots are in residential neighborhoods so it can be assumed that future use will include single or multiple family residences.

Residents in the future could come into contact with chemicals in the indoor or outdoor air if vapors migrated from the groundwater, soil or underground storage units. Residents could also come into contact with chemicals that are found in soil. Contact with soil could lead to exposure via ingestion of soil, inhalation of soil particles in the air and dermal transfer of chemicals in soil in contact with the skin.

Groundwater is not used for drinking water in the neighborhoods of any of the lots. There is a possibility that utility or construction workers could get wet while working below the surface. Groundwater at Cluster 12, Troxel, is shallow, about eight to 11 feet below ground surface; however, it is not likely that anyone would come into contact with the groundwater. The potential for exposure due to dermal absorption of chemicals in groundwater is considered insignificant. Health and safety requirements for underground work generally restrict the amount of contact that workers can have with water in a trench. Also, any contact would only happen occasionally rather than on a regular basis.

In summary, the most likely ways that people could come into contact with chemicals in the future include:

- Inhalation of chemical vapors that have migrated into indoor or outdoor air from soil, groundwater or the underground storage units
- Ingestion of chemicals in soil
- Inhalation of chemicals on particles of soil
- Absorption of chemicals from soil on their skin

3.3 Exposure Point Concentrations

The exposure point concentration is an estimate of the amount of chemical that future residents could contact at the point of exposure. The maximum concentration of each chemical detected in any sample, regardless of location, was used to calculate the risk. The maximum concentrations are presented on Table 3-1 for soil, Table 3-2 for the soil vapor samples from the temporary sampling points and Table 3-3 for soil vapor samples from the permanent monitoring wells. Therefore, a hypothetical lot is created and the concentrations of chemicals in the soil and the soil vapor are represented by the maximum concentration found in any individual lot. This approach results in an upper estimate or worst case estimate of exposure. This means that exposure at any individual lot will be lower. For outdoor air, the risk characterization in Section 5.0 will also consider the collective risk for the vapor emissions from each of the 12 property clusters.
This approach is more protective than that recommended by U.S. EPA guidance (U.S. EPA 1989 and 2002). U.S. EPA recommends using an upper bound average concentration to estimate exposure because health risk is based on daily exposure over a lifetime.

For contact with chemicals in soil, the maximum concentration in the upper 15 feet was used. Risk assessment protocols for future use assume that construction in the future could bring deeper soil to the surface where people could come into contact with chemicals. Standard practice in California is to assume that the upper 10 feet is potentially available for exposure. For this risk assessment, to

represent a protective assessment of exposure, the maximum concentration in the upper 15 feet was used. Additionally, although the BTEX compounds were not detected in soil, one half the detection limit was assigned as the exposure point concentration since these compounds were identified in soil vapor and groundwater. This adds another level of protection to the risk assessment.

The samples of soil gas collected from the permanent vapor monitoring wells and temporary soil gas sampling locations capture any chemical vapors from all sources including groundwater, soil and underground storage units. U.S. EPA recommends using the concentrations of chemicals in soil vapor to estimate migration to indoor air. Additionally, although benzene was not detected in the samples collected from the temporary soil vapor sampling locations, one half the detection limit was assigned as the exposure point concentration since benzene was identified in soil vapor samples collected from the permanent vapor wells and groundwater. This adds another level of protection to the risk assessment.

Concentrations of chemicals in indoor air (Table 3-4) were estimated using the maximum concentrations of each chemical in any soil vapor sample and the Johnson and Ettinger model (U.S. EPA 2003a and 2003b). The Johnson and Ettinger model estimates the concentration of a chemical that could migrate into a building through cracks in the foundation. This model is theoretical and has not been fully field validated. The U.S. EPA and Cal/EPA recommend the Johnson and Ettinger model and it is the only widely-used model for migration of vapors to indoor air. However, scientists are not in agreement that this or any model is adequate to predict vapor migration. Modeling input and output for the Johnson and Ettinger model are presented in Appendix B.

The following site-specific input values were used along with default model parameters for indoor and outdoor air:

- soil gas sampling depth — 304.8 centimeters (cm) (10 feet bgs)
- soil type — sand
- vadose zone soil dry bulk density — 1.61 grams per cubic centimeter (site-specific sample results)
- vadose-zone soil total porosity — 0.397 (site-specific sample results)
- vadose-zone soil water-filled porosity — 0.078 cubic centimeter per cubic centimeter (site-specific sample results)
- average soil temperature — 20 degrees Celsius (site-specific)
- residential air exchange rate — 0.66 (site specific) (Murray et al. 1995)

Concentrations of chemicals in outdoor air (Table 3-5) were estimated using the maximum concentration of the chemical found in any soil sample and the equations presented in Appendix C from the PEA guidance document (Cal/EPA 1994).

3.4 Estimation of Daily Intake

Daily intake is the amount of chemical that a receptor could potentially take in as a result of exposure. Daily intake rates are estimated by combining estimates of how much air people typically breathe each day and how much soil they contact. The parameters used to estimate intake are called exposure assumptions. Exposure assumptions are designed to estimate a reasonable maximum exposure. In other words, a level of exposure that is higher than is reasonably likely to occur so that if any exposure does occur, it is expected to generally be less than these estimates.

The exposure assumptions describe a hypothetical resident adult and child who are assumed to spend the majority of their time in situations that could bring them in contact with the chemicals. Residents are assumed to be in contact with the chemicals for 350 days a year for 30 years, 6 years as a child and 24 years as an adult. Each day, a hypothetical resident inhales air for 24 hours a day. The exposure to indoor and outdoor air is calculated separately so that the risk for indoor air and outdoor air can be viewed independently. Exposure to soil is also assumed to occur daily. The specific exposure assumptions were compiled from the PEA guidance document (Cal/EPA 1994) and are presented in Table 3-6.

The general equation for calculating intake is shown below:

$$D = (C \times CR \times EF \times ED) / (BW \times AT)$$

where

D	=	daily intake (milligrams per kilogram per day)
C	=	exposure point concentration (milligrams per kilogram [mg/kg])
CR	=	contact rate (kilograms per day)
EF	=	exposure frequency (days per year)
ED	=	exposure duration (years)
BW	=	body weight (kilograms)
AT	=	averaging time (days)

4.0 TOXICITY ASSESSMENT

In the toxicity assessment, information on the potential health effects of the chemicals identified in environmental media are evaluated and toxicity factors from appropriate sources are identified. Toxicity factors represent the properties of the chemicals that could cause an adverse health effect.

The toxicity factors are combined with the dose from the exposure assessment in the next section, Risk Characterization, to estimate the likelihood of an adverse health effect. Toxicity factors are presented in Table 4-1. Toxicity profiles are presented in Appendix D.

There are two types of toxicity factors: slope factors for chemicals that are known or potential carcinogens and reference doses for noncarcinogenic health effects. These health effects are discussed in more detail in this section. An individual chemical can have both a slope factor and a reference dose. The only chemical in this category is benzene. Benzene is the only chemical identified that is considered a carcinogen. Benzene also has a reference dose for noncancer health effects.

Toxicity factors that have been established by groups of doctors and scientists were selected from peer-reviewed sources. The following hierarchy was used to identify toxicity factors:

1. Cal/EPA Toxicity Values (Cal/EPA 2003)

2. U.S. EPA Region IX Preliminary Remediation Goals (U.S. EPA 2002) which includes toxicity data from the following sources and includes the applicability of route to route extrapolation:

   - Integrated Risk Information System (U.S. EPA 2003c);
   - Health Effects Assessment Summary Tables (U.S. EPA 1997); and
   - National Center for Environmental Assessment.

4.1 Toxicity Factors for Carcinogens

The toxicity factor for carcinogens is the slope factor. Slope factors are expressed in (mg/kg of body weight per day)$^{-1}$. Slope factors are developed with a mathematical model that extrapolates data from laboratory animals exposed to high doses to estimate the probability of an increased incidence of cancer in humans exposed to much lower doses. The laboratory animals are exposed to the maximum dose that they can tolerate for relatively short periods in the laboratory, but human receptors would be exposed to very low levels over long periods. Slope factors are used to estimate the probability that an individual will have an increased risk of cancer above their baseline risk.

4.2 Toxicity Factors for Noncarcinogenic Effects

The potential for noncarcinogenic health effects is estimated using a toxicity factor known as the reference dose (RfD). Each RfD is associated with a specific health effect (e.g., central nervous system damage), also referred to as a toxicity endpoint.

The current scientific view assumes that for noncarcinogenic health effects, there is a concentration below which there is little potential for adverse health effects over the exposure period. That concentration is referred to as the threshold concentration. RfD are derived from either occupational exposure or animal studies and are adjusted using uncertainty factors. The RfD is calculated from the highest chronic (long-term) exposure level that did not cause adverse effects in the population (human or laboratory animal) studied. A safety factor is applied to this level to allow for any uncertainty, such as using data on animals to predict effects on humans. These factors range up to 10,000 based on the confidence level associated with the data.

Currently, neither Cal/EPA or U.S. EPA has derived toxicity factors for petroleum hydrocarbon mixtures. However, the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG), Toxicology Technical Action Group has developed toxicity factors for petroleum hydrocarbon fractions. This methodology is consistent with that used by Cal/EPA and U.S. EPA to derive toxicity factors for other chemicals. The TPHCWG is a consortium of private and public organizations, including state regulatory agencies, academia, the Department of Defense, Department of Energy, Agency for Toxic Substances and Disease Registry, the U.S. EPA, the petroleum, power and transportation industries, and consulting firms. The TPHCWG methodology

is published in the document Development of Fraction-Specific Reference Doses (RfDs) and Reference Concentrations (RfCs) for Total Petroleum Hydrocarbons (TPHCWG 1997). The methodology is used in this assessment to develop RfDs for the three groups of TPH measured in the samples of environmental media.

TPH compounds are divided into two categories: aromatic and aliphatic. Aromatic compounds are hydrocarbons that are arranged in a ring structure. The most common and important aromatic compounds are benzene, ethylbenzene, toluene and xylene. These chemicals are considered among the most toxic components of TPH and were analyzed for separately in the environmental media. The chemicals measured in the TPH are assumed to be aliphatic hydrocarbons (arranged in a linear structure). These chemicals are known to have only non-cancer effects. The RfDs recommended by the TPHCWG are used in this risk assessment (Table 4-1).

5.0 RISK CHARACTERIZATION

The final step in the risk assessment process is the characterization of risk, in which exposure and toxicity information are combined to evaluate potential health risks. In this section, the daily intake from the exposure assessment is combined with the toxicity factor from the toxicity assessment to estimate the likelihood of a health risk. Equations from the PEA guidance document (Appendix C) were used to calculate the cancer risk and hazard indices. A summary of the risks is presented in Table 5-1.

5.1 Overview of Cancer Risk

Cancer risk is described as the individual excess cancer risk (cancer risk) and is expressed as a probability. It is an estimate of the probability that the hypothetical individual who has the level of exposure described by this risk assessment would have an increased risk in cancer incidence. Cancer risk does not predict actual cases of cancer. A risk of $1x10^{-6}$ means that there is a probability of 1 in a million of increased incidence of cancer above the baseline or normal cancer rate.

Cal/EPA and U.S. EPA have established a range of acceptable cancer risks of $1x10^{-4}$ to $1x10^{-6}$ for Superfund Sites. This means that cancer risk levels should be between an upper limit of 1 in 10,000 probability to a de minimis level of 1 in 1,000,000. Cancer risk below 1×10^{-6} are considered negligible. Cancer risk for different chemicals in the same exposure pathways are added together to assess the cumulative risk for exposure to multiple chemicals. Also, cancer risks for each exposure pathway are added together to determine the risk associated with exposure to all the chemicals and routes of exposure.
This risk assessment, using the maximum detected concentration for exposure, is designed to over-estimate the potential for risk so that any actual risk, if any is present, will be less than the calculated risks, and, in fact, may be zero.

5.2 Overview of Noncarcinogenic Health Effects

Noncarcinogenic health effects are expressed as the ratio between the daily intake and the reference dose. The reference dose is defined as a level of daily exposure that is unlikely to result in noncarcinogenic adverse health effects over a lifetime of exposure. Hence, hazard values greater than 1 indicate that exposure is greater than the recommended level, while hazard values less than 1 show that exposure is lower than the recommended level.

Hazard values for individual chemicals are called hazard quotients and those for several chemicals added together are called hazard indices. Hazard indices for each pathway were added together to assess the overall potential for noncarcinogenic adverse health effects although, in accordance with U.S. EPA guidance, it is only appropriate to add hazard quotients for chemicals that affect the same target organ. The hazard indices in this risk assessment will tend to overestimate noncancer health effects for this reason.

5.3 Risk Characterization Results

The estimated probability of an increased incidence of cancer for the residential future use scenario assuming 30-year exposure to the maximum chemical concentration found in any sample at any property cluster is 4×10^{-7}. The estimated noncarcinogenic hazard index is 0.6. Both these values are below Cal/EPA and U.S. EPA levels of no-significant risk. The cancer risk is 2.5 times lower than the no-significant risk level and the noncarcinogenic hazard index is more than 1.5 times lower than the recommended level.

Table 5-2. Total Cancer Risk and Hazard Index

Exposure Pathway	Cancer Risk	Hazard Index
Contact with soil (ingestion and dermal)	9×10^{-10}	0.09
Inhalation of outdoor air	2×10^{-9}	0.06
Inhalation of indoor air	4×10^{-7}	0.5
TOTAL	**4×10^{-7}**	**0.6**

Inspection of this table also shows that the collective impact of all lots on the outdoor air is minimal. In a worst-case situation, if all lots emitted vapors to the outdoor air at the maximum concentration and the risks were multiplied by at factor of 12, the cancer risk and noncancer hazard would still be below the risk management levels.

6.0 UNCERTAINTY ANALYSIS

The uncertainty analysis discusses the level of confidence that can be placed in the results of the risk assessment including, but not limited to, the adequacy of the sampling and resulting data, the omission of any chemicals from the quantitative risk assessment, the exposure assumptions, the

calculation of exposure point concentrations, the sensitivity of fate and transport models, uncertainty around toxicity factors and risk characterization.

Risk assessments do not estimate actual health effects risks but are intended for use as a decision-making tool indicating, in a relative sense, the chemicals or types of exposure that could contribute the most risk. Risk assessments are used to help determine if the risks associated with exposure warrant corrective action. Such decisions depend not only on the calculated risk estimates, but also on the uncertainties and assumptions incorporated into the risk estimates. Accordingly, we provide a discussion of the more important uncertainties.

The uncertainties associated with each chapter in the risk assessment and their potential effects on the numerical risk estimates are discussed below.

6.1 Data Evaluation

Uncertainties are associated with the collection, analysis and evaluation of environmental data regarding the chemicals of potential concern selected for use in the risk assessment. The sampling plan used for this risk assessment is considered adequate to address the completed exposure pathways. The samples collected were collected from locations known or suspected to be impacted by chemicals. These samples were analyzed for TPH and the volatile organic chemicals including benzene, toluene, ethylbenzene, and xylene, and semivolatile organic chemicals. The laboratory results for these chemicals include 86 soil samples (48 of which are at or above 15 feet below ground surface), 231 soil vapor samples and 21 groundwater samples.

6.2 Exposure Assessment

An area of uncertainty in exposure assessment is the prediction of human activities that lead to contact with environmental media and exposure to chemicals and the models used to calculate these exposure concentrations. Activities that differ from those used in the exposure assessment could lead to higher or lower risks than those estimated. To compensate for this uncertainty, estimates of exposure were used that tend to overestimate exposure. Therefore, if some of the activities do not occur or occur for shorter periods of time than the estimates used in this risk assessment, the risks presented here would be higher than any actual risk.

The standard approach to estimating the exposure concentration is to use a weighted average of all the concentrations measured in each sample in the exposure unit. This is because health risk is based on a lifetime average. In this risk assessment, the exposure concentration is based on the maximum concentration of each chemical for each pathway, regardless of where the chemical was detected. This is a highly protective assumption because this means that the maximum concentration was assumed to be present throughout the media, e.g., soil, soil vapor, and was assumed to not decrease in concentration for the exposure period of 30 years for residents.

There is uncertainty associated with the reliability of modeling vapor migration, particularly at Cluster 12, Troxel, where groundwater is shallow (eight to 11 feet below ground surface). Benzene and other volatile chemicals were identified in the groundwater at Cluster 12 but not in the soil vapor. It may be that the volatile chemicals are naturally degraded and do not migrate upwards or it

may be that vapors would migrate into a home built on this lot. In this risk assessment the benzene concentration in soil gas at Cluster 12 was assumed to be equal to the greatest concentration detected in any of the lots.

6.3 Toxicity Assessment

Use of cancer slope factors and reference doses are subject to several types of uncertainties. Typically, the studies from which these values are derived involve conditions that are not identical to the types of exposures of interest. Extrapolations from animal experiments to human health effects are frequently required to derive a toxicity value for use in risk assessment. The mathematical models used in the extrapolations are designed to be protective but there is a level of uncertainty in these models as there is limited means to verify the models.

The toxicity of each chemical was assumed to be additive. Interactions between chemicals, synergisms or antagonisms, were not accounted for because there is limited toxicity information on these types of interactions. Therefore, attempting to account for interactions could result in over- or under-estimations of the risks.

Benzene is the only chemical that is a known human carcinogen or Class A carcinogen. Benzene has been shown to cause cancer in occupational settings to workers who use it routinely at high concentrations.

6.4 Risk Characterization

The results of the risk assessment found that the cancer risk and noncancer hazard indices are well below levels considered insignificant by federal and state agencies. Every effort has been made to compensate for the inherent uncertainties in risk assessment. However, there is controversy around the reliability of the model that both the U.S. EPA and Cal/EPA use (the only model for vapor intrusion) use to predict vapor migration.

This risk assessment recommends mitigation measures be considered in the Environmental Impact Report prepared such as those required by the Los Angeles City Building Code Section 91.106.4.1 and Division 71 of Article 1, Chapter IX of the Los Angeles Municipal Code. This code requires mitigations for methane and other gases be implemented when future construction occurs at these sites. These measures include the installation of vapor membrane barriers and vent piping as well as trench dams and electrical seal offs. .

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*There reports are available from the California Public Utilities Commission upon written request.

TABLES

Table 3-1
Maximum Concentrations of Chemicals in Soil (0-15 feet bgs)

Chemical	Maximum Concentration	Location of Maximum	Number of Samples	Number of Non-Detects
TPH (C6-C10)	12	C8-L23-B3-5	48	45
TPH (C10-C22)	300	C10-L7-B2-5	48	45
TPH (C22-C36)	770	C6-L29-B1-5	48	35
Benzene*	0.0025	na	48	48
Toluene*	0.0025	na	48	48
Ethylbenzene*	0.0025	na	48	48
Xylenes*	0.0025	na	48	48
Gasoline*	1.5	na	48	48

All concentration presented in milligrams chemical (mg) per kilograms soil (kg); equivalent to parts per million (ppm)

* In order to include chemicals detected in some media but in all media, 1/2 the detection limit was used as the maximum concentration when the chemical was not detected in any

This table presents the maximum soil concentrations. These data are used to evaluate the direct contact pathway (ingestion of soil, inhalation of vapors and particles in outdoor air) and to calculate concentrations of chemicals in outdoor air in the exposure assessment .

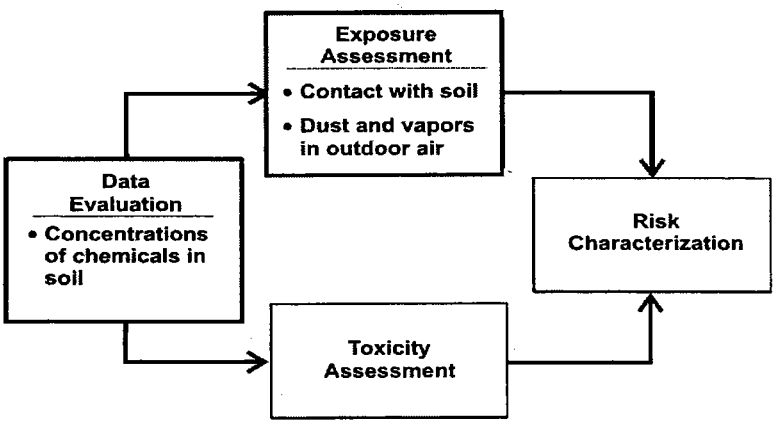


Table 3-2
Maximum Concentration of Chemicals in Soil Vapor from Temporary Vapor Sampling Points

Chemical	Molecular Weight	Maximum Concentration µg/L	Maximum Concentration ppbv	Location of Maximum	Number of Samples	Number of Non-Detects
Benzene*	78.1	0.5	154	na	175	175
Toluene	92	1.8	471	C2-L3-SG2-10'	175	171
Ethylbenzene	106.2	12	2,718	C2-L3-SG4-10'	175	163
m- and p-Xylene	106.2	56	12,682	C2-L3-SG4-10'	175	155
o-Xylene	106.2	16	3,623	C2-L3-SG4-10'	175	163
Gas Range Organics	na	240	nc	C3-L15-SG1-10'	175	163

$$X\ ppbv = \frac{Y\ \frac{\mu g}{L} \times 24.05 \times 1000}{MW}$$

* The maximum concentration is based on 1/2 the detection limit because benzene was not identified in any sample

µg/L - micrograms per liter
nc - not calculated because it is not possible to estimate a molecular weight for a complex mixture
ppbv - parts per billion by volume

This table presents the maximum soil vapor concentrations identified in the temporary wells and shows how the units of microgram per liter of air (ug/L) were converted to parts per billion by volume (ppbv). These data are used to calculate concentrations of chemicals in indoor air in the exposure assessment .

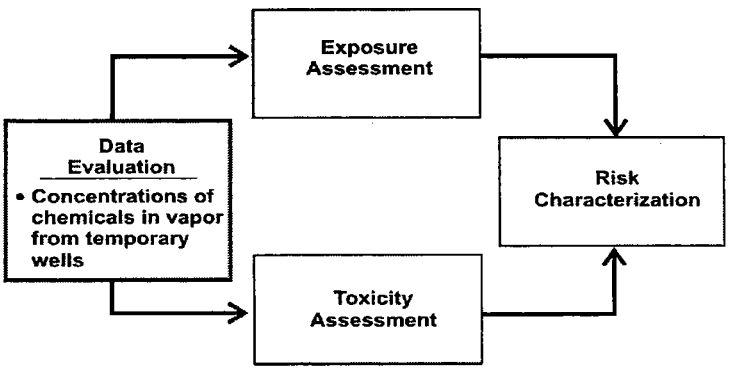


Table 3-3
Maximum Concentrations of Chemicals in Soil Vapor from Permanent Vapor Wells

Chemical	Maximum Concentration	Location of Maximum	Number of Samples	Number of Non-Detects
Benzene	23	C11-L19-VW2-Shallow	56	51
Ethylbenzene	9.3	C11-L19-VW2-Shallow	56	41
m, p-Xylene	12	C11-L19-VW2-Shallow	56	32
o-Xylene	4.2	C11-L19-VW2-Shallow	56	43
Toluene	18	C11-L19-VW2-Shallow	56	11
Xylene	14	C11-L19-VW2-Shallow	14	7
TPH-g (ppmv)	100	C11-L19-VW2-Shallow	56	49
TPH-g (ug/L)	370	C11-L19-VW2-Shallow	56	49

All concentration presented in ppbv except where noted.

µg/L - micrograms per liter
ppbv - parts per billion by volume
ppmv - parts per million by volume

This table presents the maximum soil vapor concentrations identified in the permanent wells. These data are used to calculate concentrations of chemicals in indoor air in the exposure assessment .

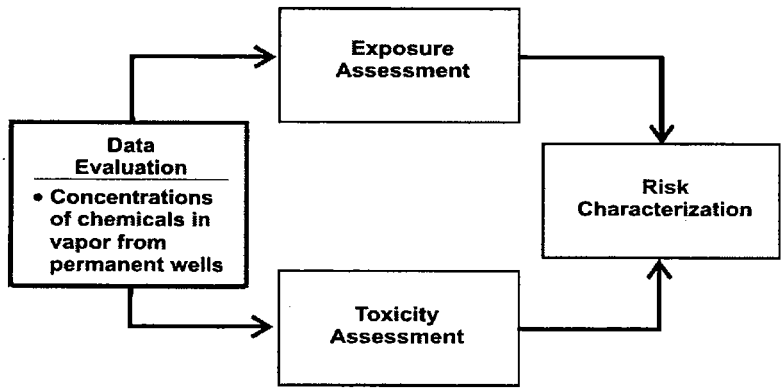


Table 3-4
Estimated Concentrations of Chemicals in Indoor Air

Chemical	Maximum Concentration in Soil Gas/Vapor ppbv	Indoor Air µg/m³
Benzene	23	2.36E-02
Ethylbenzene	2,718	3.40E+00
m, p-Xylene	12,682	1.61E+01
o-Xylene	3,623	5.01E+00
Toluene	471	5.65E-01
Xylene	14	nc
Gas Range Organics (µg/L)	240	nc
TPH-g	100,000	nc
TPH-g (ug/L)	370	nc

ppbv - parts per billion by volume
µg/m³ - micrograms per cubic meter
nc - not calculated because chemical specific input parameters are not available to allow modeling of vapor migration

This table presents the maximum soil vapor concentrations from either the temporary (Table 3-2) or permanent (Table 3-3) wells and the indoor air concentrations calculated using the Johnson and Ettinger Indoor Air Model. The indoor air concentrations were used to evaluate the indoor air pathway.

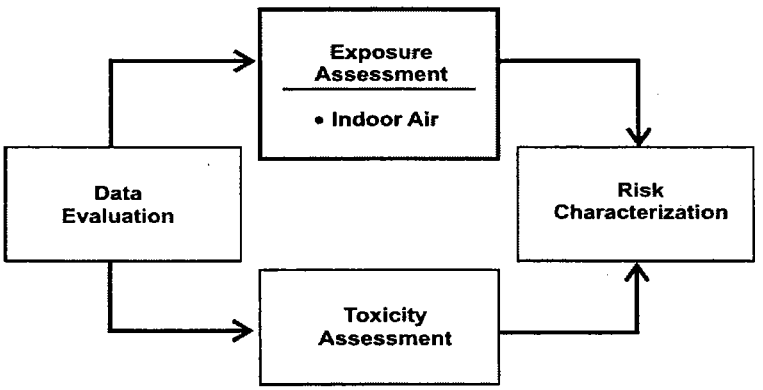


Table 3-5
Estimated Concetrations of Chemicals in Outdoor Air

Chemical	Bulk Soil Concentration[1]	Hc	Koc	foc	Kd	Di	Ei	Ca
TPH (C6-C10)	1.2E-05	8.00E-01	631	0.02	12.6	0.1	2.6E-01	2.6E-03
TPH (C10-C22)	3.0E-04	1.27E+01	50118	0.02	1002	0.1	2.5E+00	2.5E-02
TPH (C22-C36)[2]	7.7E+02							3.9E-05
Benzene	2.5E-09	5.43E-03	65	0.02	1.3	0.088	1.1E-05	1.1E-07
Toluene	2.5E-09	5.94E-03	257.04	0.02	5.1	0.078	5.4E-06	5.4E-08
Ethylbenzene	2.5E-09	8.44E-03	220	0.02	4.4	0.075	6.8E-06	6.9E-08
Xylenes	2.5E-09	5.30E-03	240	0.02	4.8	0.087	5.6E-06	5.6E-08

1. Bulk soil concentration = maximum concentration of chemical in soil, mg/kg x (10^{-6} kg/mg)
2. Concentration presented as is (i.e., no multiplication by 10^{-6})

TPH - total petroleum hydrocarbons
mg/kg - milligrams per kilogram
kg/mg - kilograms per milligram

Hc - chemial-specific Henry's Law Constant (atmospheres-cubic meter per mol, atm-m^3/mol)
Koc - chemial-specific organic carbon to water partition coefficient (liters per kilogram, l/kg)
foc - fraction organic carbon in soil (PEA default = 0.02)
Kd - soil-water partition coefficient, (cubic centimeter per gram, cm^3/g)
Di - diffusion coefficient in air of chemical (centimeter squared per second, cm^2/sec)
Ei - average emission rate of chemical over the residential lot during the exposure interval (milligram per second, mg/sec)
Ca - concentration in air (milligrams per cubic meter, mg/m^3)

Chemical specific values for benzene, toluene, ethylbenzene, and xylenes were compiled from the PEA document.
Hc for the TPH fractions obatained from TPHCWG - Volume 5

This table presents the maximum soil concentrations and shows the calculation of the outdoor air concentrations using equations from the California Preliminary Endangerment Assessment (PEA) Guidance Document. The outdoor air concentrations were used to evaluate the outdoor air pathway.

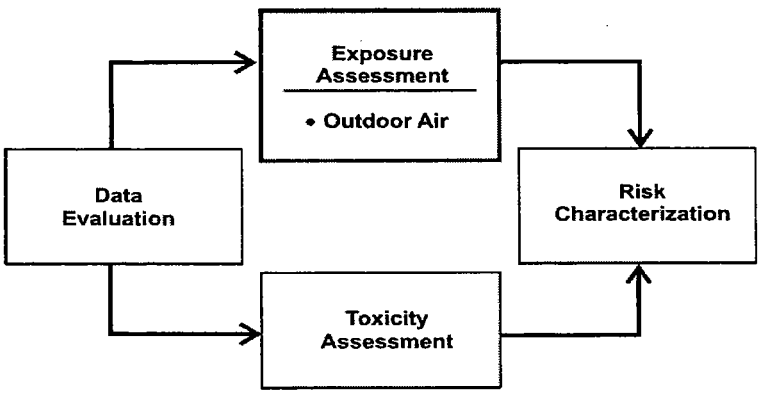


Table 3-6
Exposure Assumptions for Daily Intake

Pathway	Parameter	Resident Child	Resident Adult
Inhalation Of Volatilized Gases	IR - Inhalation Rate (m^3/day)	10	20
	EF - Exposure Frequency (day/yr)	350	350
	ED - Exposure Duration (yr)	6	24
	BW - Body Weight (kg)	15	70
	AT - Averaging Time, Carcinogen (days)	25550	25550
	AT - Averaging Time, Noncarcinogen (days)	2190	na
Inhalation Of Particulates	IR - Inhalation Rate (m^3/day)	10	20
	EF - Exposure Frequency (day/yr)	350	350
	ED - Exposure Duration (yr)	6	24
	BW - Body Weight (kg)	15	70
	AT - Averaging Time, Carcinogen (days)	25550	25550
	AT - Averaging Time, Noncarcinogen (days)	2190	na
Incidental Ingestion of Soil	IR - Ingestion Rate (mg/day)	200	100
	EF - Exposure Frequency (day/yr)	350	350
	ED - Exposure Duration (yr)	6	24
	BW - Body Weight (kg)	15	70
	AT - Averaging Time, Carcinogen (days)	25550	25550
	AT - Averaging Time, Noncarcinogen (days)	2190	na
	CF - Conversion Factor (kg/mg)	1E-6	1E-6
Dermal Contact with Soil	SA - Surface Area (cm^2/day)	2000	5800
	ABS - Absorption Coefficient	CSV	CSV
	AF - Adherence Factor (mg/cm^2)	1	1
	EF - Exposure Frequency (day/yr)	6	24
	ED - Exposure Duration (yr)	350	100
	BW - Body Weight (kg)	15	70
	AT - Averaging Time, Carcinogen (days)	25550	25550
	AT - Averaging Time, Noncarcinogen (days)	2190	na
	CF - Conversion Factor (kg/mg)	1E-6	1E-6

cm^2/day - centimeter squared per day
CSV - chemical-specific value
day/yr - days per year
kg - kilogram
kg/mg - kilograms per milligram
m^3/day - cubic meters per day
mg/cm^2 - milligrams per sqaured centimeter
mg/day - milligrams per day
yr - years

Source: DTSC (1994) - Preliminary Endangerment Assessment, January 1994

This table presents the exposure assumptions that describe the amount time time that people could come into contact with chemicals and the amount of chemical they might take into their bodies. The equations used to calculate daily intake are presented in Appendix 3.

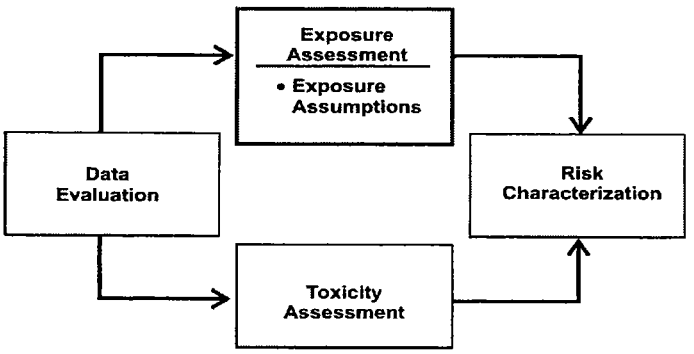


Table 4-1
Toxicity Factors

Chemical	RfDo (mg/kg-day)	RfDi (mg/kg-day)	CSFo $(mg/kg\text{-}day)^{-1}$	CSFi $(mg/kg\text{-}day)^{-1}$
Benzene	4.0E-03	8.6E-03	1.0E-01	1.0E-01
Toluene	2.0E-01	1.1E-01	na	na
Ethylbenzene	1.0E-01	2.9E-01	na	na
m-, p-Xylene	2.0E-01	2.9E-02	na	na
o-Xylene	2.0E-01	2.9E-02	na	na
TPH (C6-C10)	1.0E-01	2.9E-01	na	na
TPH (C10-C22)	1.0E-01	2.9E-01	na	na
TPH (C22-C36)	2.0E+00	2.0E+00	na	na

RfDo - oral reference dose in milligrams per kilogram per day (mg/kg-day)
RfDi - inhalation reference dose in milligrams per kilogram per day
CSFo - oral cancer slope factor in (milligrams per kilogram per day)$^{-1}$ $(mg/kg\text{-}day)^{-1}$
CSFi - inhalation cancer slope factor in (milligrams per kilogram per day)-1
na - not applicable (no toxicity value has been established by Cal/EPA or U.S. EPA)

This table presents the toxicity factors developed by U.S.EPA and Cal/EPA to represent the potential cancer and noncancer health effects of the chemicals. These factors are combined with the chemical concentrations in soil, indoor air and outdoor air and the exposure assumptions to calculate the risk to human health.

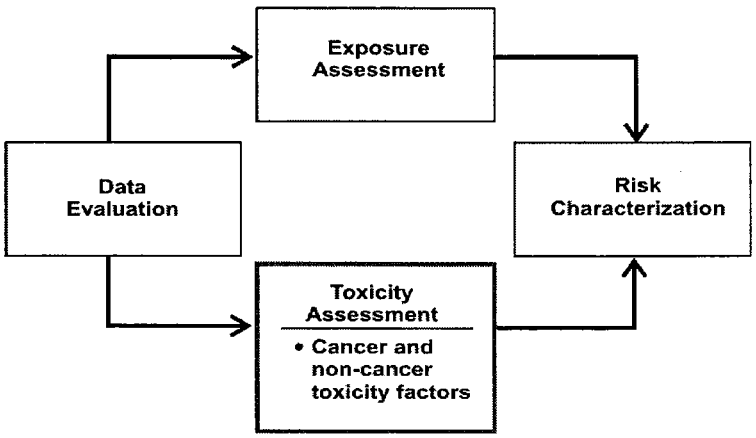


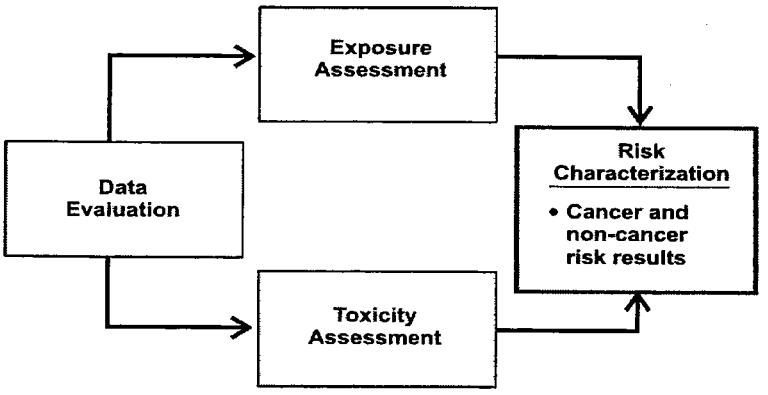
Table 5-1
Summary of Cancer Risks and Hazard Indices

Chemical	Cancer Risk			Hazard Index		
	Soil	Outdoor Air	Indoor Air	Soil	Outdoor Air	Indoor Air
Chemicals Identified in Soil Vapor Samples (used to estimate indoor air risk)						
Benzene	---	---	4×10^{-7}	---	---	0.002
Toluene	---	---	na	---	---	0.003
Ethylbenzene	---	---	na	---	---	0.007
m-, p-Xylene	---	---	na	---	---	0.4
o-Xylene	---	---	na	---	---	0.1
Chemicals Identified in Soil Samples (used to estimate risk from direct contact with soil and outdoor air)						
Benzene	9×10^{-10}	2×10^{-9}	*	0.00002	0.000008	*
Toluene	na	na	*	0.0000003	0.0000003	*
Ethylbenzene	na	na	*	0.0000006	0.0000002	*
Xylenes	na	na	*	0.0000003	0.000001	*
TPH (C6-C10)	na	na	*	0.003	0.006	*
TPH (C10-C22)	na	na	*	0.08	0.06	*
TPH (C22-C36)	na	na	*	0.01	0.00001	*
TOTAL	**9×10^{-10}**	**2×10^{-9}**	**4×10^{-7}**	**0.09**	**0.06**	**0.5**

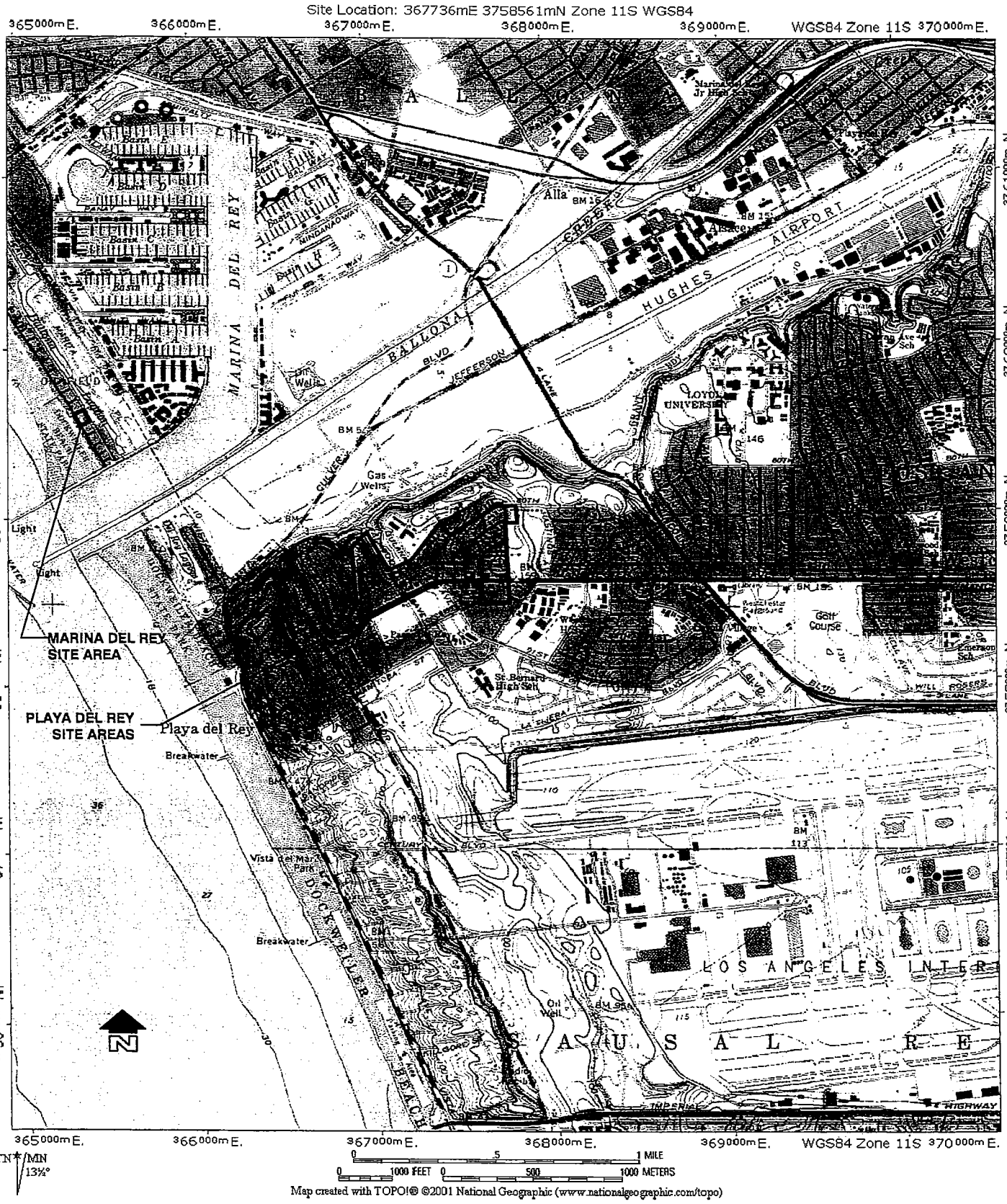
Total Cancer Risk	**4×10^{-7}**	**below the State and Federal Level of No-Significant Risk of 1×10^{-6}**
Total Hazard	**0.6**	**below the State and Federal Safe Level for Lifetime Exposure of 1**

--- - vapor samples were only used to estimate risks for indoor air
* - soil data were only used to evaluate ingestion of soil, dermal contact with soil and inhalation of volatiles and particulates in outdoor air
na - not applicable, chemical not considered a potential human carcinogen

This table presents the results of the risk assessment.



FIGURES



DATE	PROJECT NUMBER
MAR 2004	23483

BROWN AND CALDWELL
IRVINE, CALIFORNIA

SITE LOCATION MAP

PROJECT LOCATION: MARINA DEL REY AND PLAYA DEL REY, CALIFORNIA

FIGURE 1.1.1

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JURE 1.1 | Ref Files : SITETOPO.JPG
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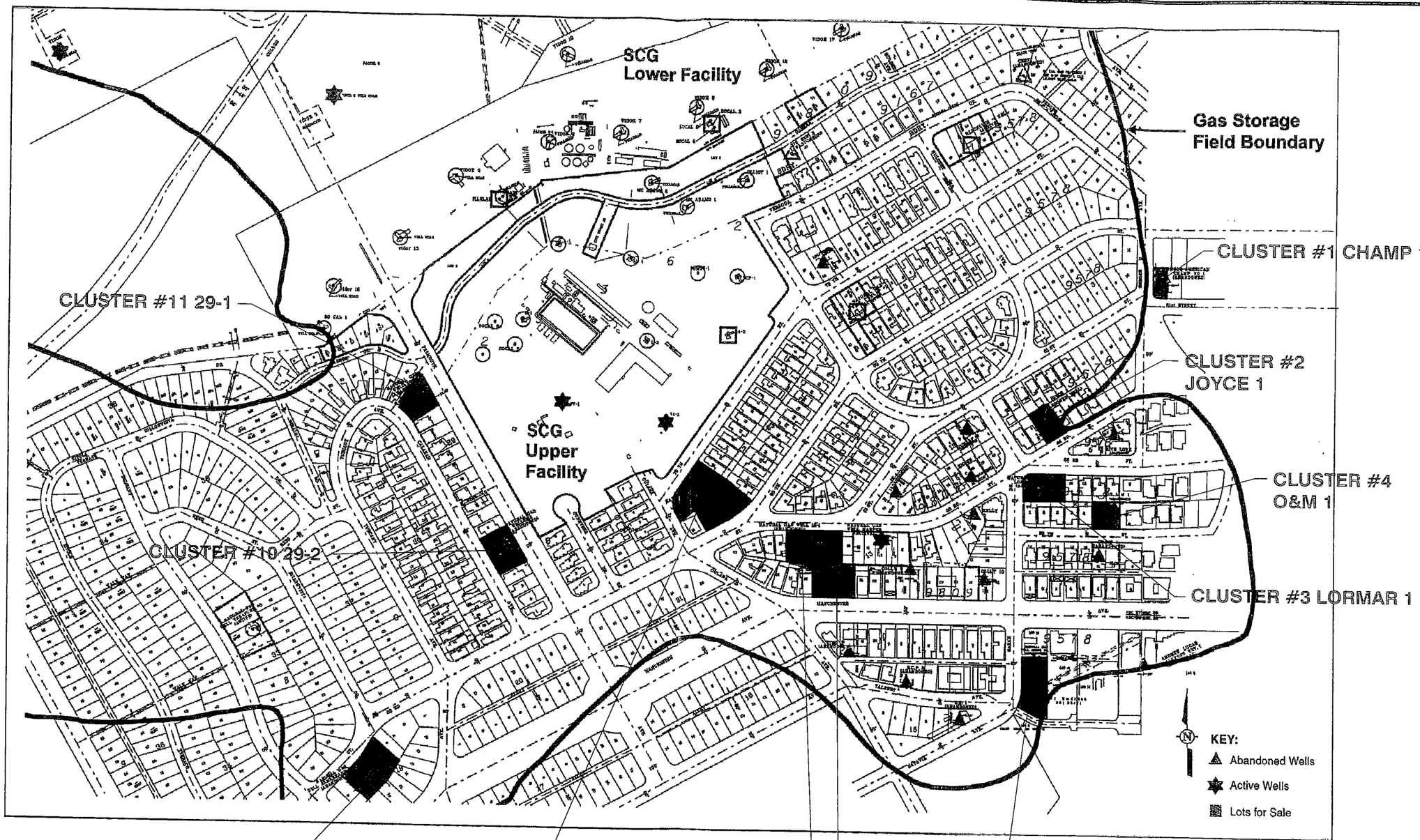

CLUSTER #9 SAMARKAND 1

CLUSTER # 8 23-1

CLUSTER #7 13-1

CLUSTER #6 MERRILL 1

CLUSTER #5 HISEY 1

FIGURE 1.1.2

PLAYA DEL REY PROPERTY CLUSTERS (#1-#11)

PROJECT LOCATION	DATE	PROJECT NUMBER
MARINA DEL REY AND PLAYA DEL REY, CALIFORNIA	MAR 2004	23483

BROWN AND CALDWELL

IRVINE, CALIFORNIA

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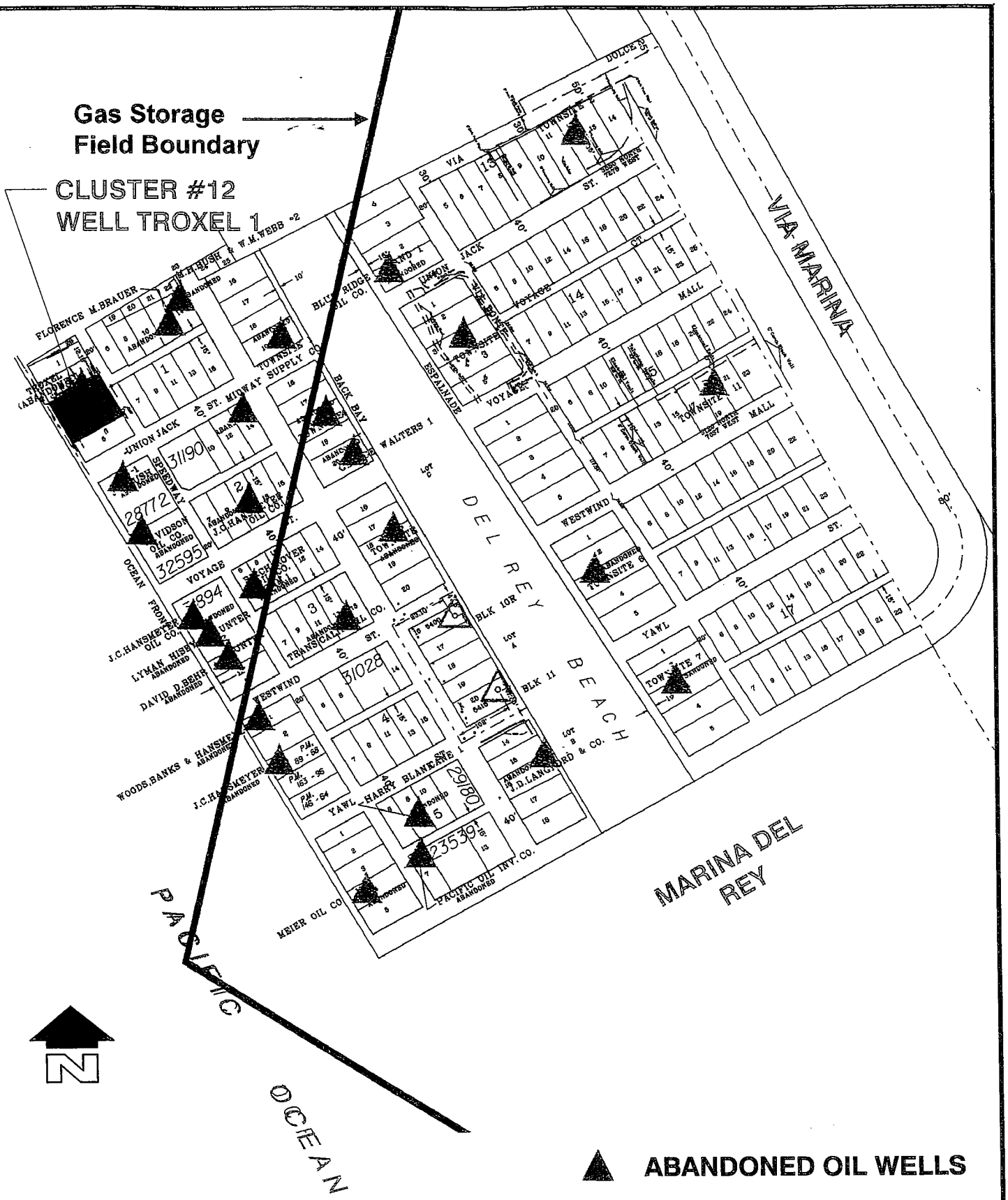

DATE	PROJECT NUMBER	MARINA DEL REY LOT CLUSTER #12
MAR 2004	23483	

BROWN AND CALDWELL
IRVINE, CALIFORNIA

PROJECT LOCATION: MARINA DEL REY AND PLAYA DEL REY, CALIFORNIA

FIGURE 1.1.3

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x11 | Ref Files : FIGURE 1-3.jpg

23483 - CPUC\CAD\HealthRisk\23483FIG1-3.dwg

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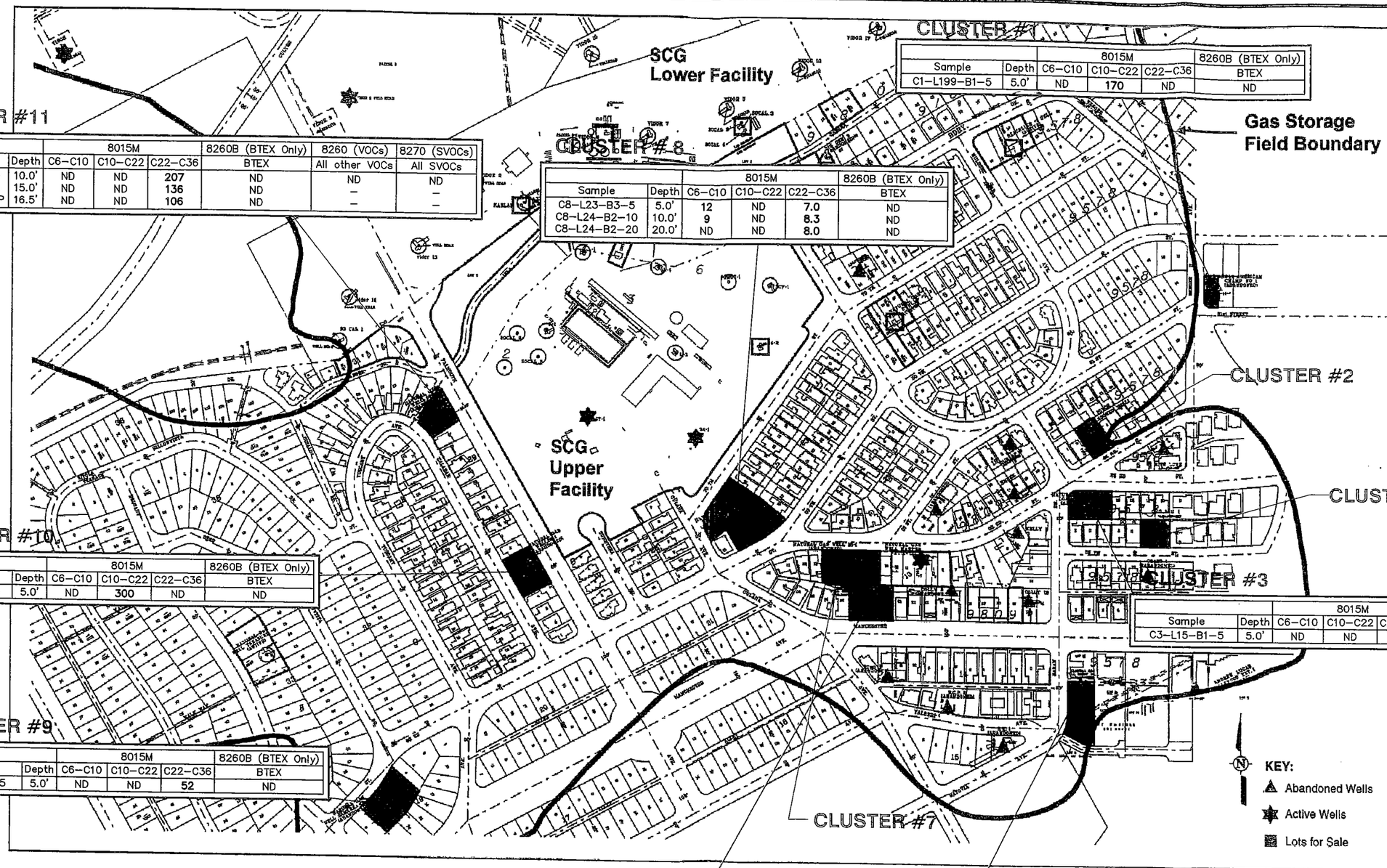

CLUSTER #1

Sample	Depth	8015M C6–C10	8015M C10–C22	8015M C22–C36	8260B (BTEX Only) BTEX
C1–L199–B1–5	5.0'	ND	170	ND	ND

CLUSTER #11

Sample	Depth	8015M C6–C10	8015M C10–C22	8015M C22–C36	8260B (BTEX Only) BTEX	8260 (VOCs) All other VOCs	8270 (SVOCs) All SVOCs
C11–L19–B2–10	10.0'	ND	ND	207	ND	ND	ND
C11–L19–B2–15	15.0'	ND	ND	136	ND	–	–
C11–L19–B2–DUP	16.5'	ND	ND	106	ND	–	–

CLUSTER #8

Sample	Depth	8015M C6–C10	8015M C10–C22	8015M C22–C36	8260B (BTEX Only) BTEX
C8–L23–B3–5	5.0'	12	ND	7.0	ND
C8–L24–B2–10	10.0'	9	ND	8.3	ND
C8–L24–B2–20	20.0'	ND	ND	8.0	ND

CLUSTER #10

Sample	Depth	8015M C6–C10	8015M C10–C22	8015M C22–C36	8260B (BTEX Only) BTEX
C10–L7–B2–5	5.0'	ND	300	ND	ND

CLUSTER #3

Sample	Depth	8015M C6–C10	8015M C10–C22	8015M C22–C36	8260B (BTEX Only) BTEX
C3–L15–B1–5	5.0'	ND	ND	280	ND

CLUSTER #9

Sample	Depth	8015M C6–C10	8015M C10–C22	8015M C22–C36	8260B (BTEX Only) BTEX
C9–L5–B1–5	5.0'	ND	ND	52	ND

CLUSTER #6

Sample	Depth	8015M C6–C10	8015M C10–C22	8015M C22–C36	8260B (BTEX Only) BTEX
C6–L29–B1–5	5.0'	ND	ND	770	ND

CLUSTER #5

Sample	Depth	8015M C6–C10	8015M C10–C22	8015M C22–C36	8260B (BTEX Only) BTEX
C5–L11–B1–10	10.0'	ND	3.0	10	ND

LEGEND

8015M	EPA METHOD 8015M FOR TOTAL PETROLEUM HYDROCARBONS
8260B	EPA METHOD 8260B FOR VOLATILE ORGANIC COMPOUNDS
BTEX	BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
SCG	SOUTHERN CALIFORNIA GAS
ND	NOT DETECTED AT OR ABOVE DETECTION LIMIT

NOTES:
RESULTS ARE IN PARTS PER MILLION (ppm)

FIGURE 2.1.1
PLAYA DEL REY PROPERTY CLUSTERS (#1-#11) PHASE II SOIL SAMPLE RESULTS (SAMPLES WITH DETECTIONS ONLY)

PROJECT LOCATION: PLAYA DEL REY, CALIFORNIA

DATE: MAR 2004

PROJECT NUMBER: 23483

BROWN AND CALDWELL
IRVINE, CALIFORNIA

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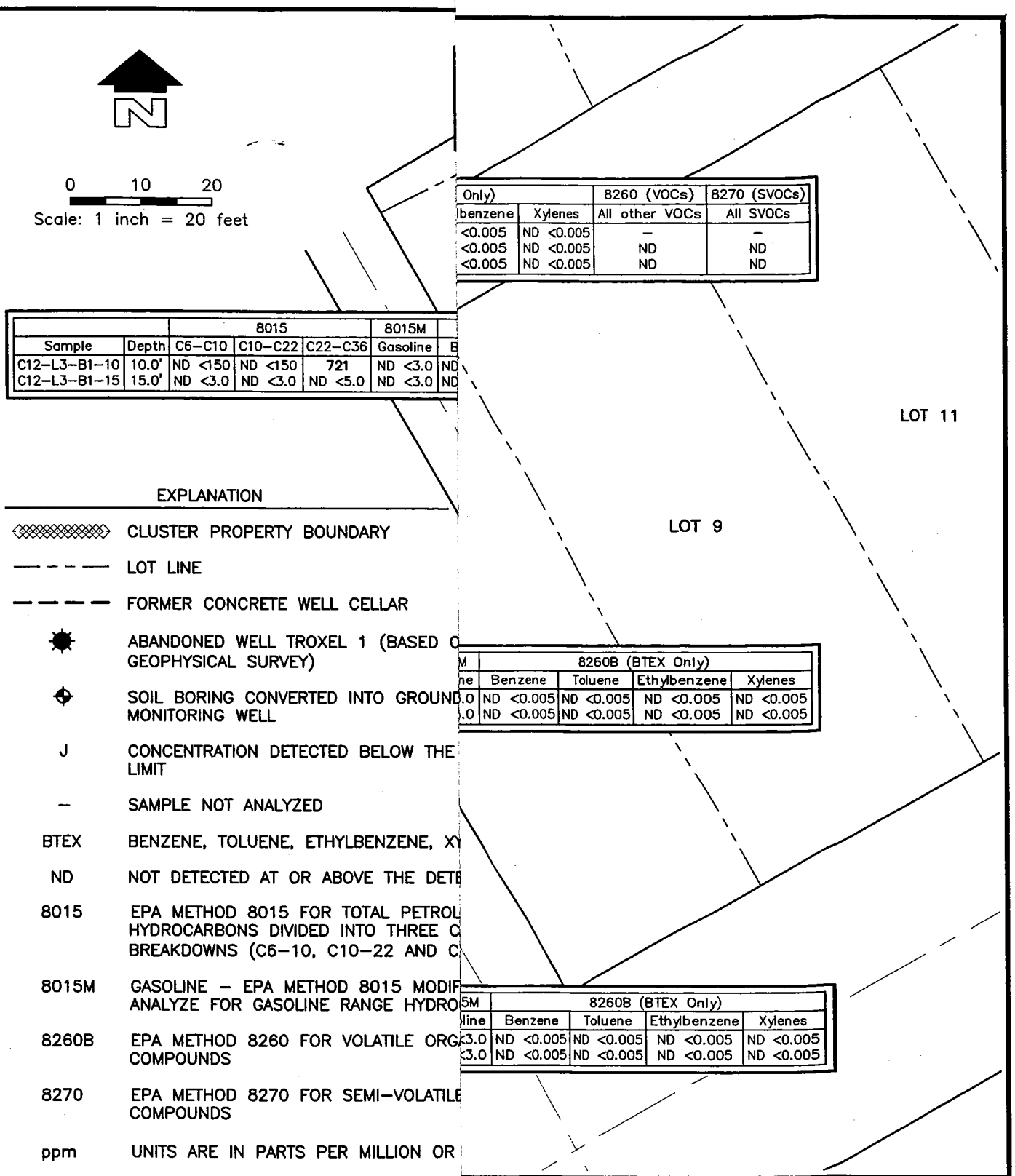

Only)		8260 (VOCs)	8270 (SVOCs)
lbenzene	Xylenes	All other VOCs	All SVOCs
<0.005	ND <0.005	–	–
<0.005	ND <0.005	ND	ND
<0.005	ND <0.005	ND	ND

		8015			8015M	
Sample	Depth	C6–C10	C10–C22	C22–C36	Gasoline	B
C12–L3–B1–10	10.0'	ND <150	ND <150	**721**	ND <3.0	ND
C12–L3–B1–15	15.0'	ND <3.0	ND <3.0	ND <5.0	ND <3.0	ND

M	8260B (BTEX Only)			
ne	Benzene	Toluene	Ethylbenzene	Xylenes
.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005

5M	8260B (BTEX Only)			
line	Benzene	Toluene	Ethylbenzene	Xylenes
<3.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
<3.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005

EXPLANATION

- CLUSTER PROPERTY BOUNDARY
- LOT LINE
- FORMER CONCRETE WELL CELLAR
- ABANDONED WELL TROXEL 1 (BASED O GEOPHYSICAL SURVEY)
- SOIL BORING CONVERTED INTO GROUND MONITORING WELL
- J — CONCENTRATION DETECTED BELOW THE LIMIT
- – — SAMPLE NOT ANALYZED
- BTEX — BENZENE, TOLUENE, ETHYLBENZENE, XY
- ND — NOT DETECTED AT OR ABOVE THE DETE
- 8015 — EPA METHOD 8015 FOR TOTAL PETROL HYDROCARBONS DIVIDED INTO THREE C BREAKDOWNS (C6–10, C10–22 AND C
- 8015M — GASOLINE – EPA METHOD 8015 MODIF ANALYZE FOR GASOLINE RANGE HYDRO
- 8260B — EPA METHOD 8260 FOR VOLATILE ORG COMPOUNDS
- 8270 — EPA METHOD 8270 FOR SEMI–VOLATILE COMPOUNDS
- ppm — UNITS ARE IN PARTS PER MILLION OR
- MG/KG — MILLIGRAMS PER KILOGRAM
- BTEX — BENZENE, TOLUENE, ETHYLBENZENE, A
- VOCs — VOLATILE ORGANIC COMPOUNDS
- SVOCs — SEMIVOLATILE ORGANIC COMPOUNDS

SOURCE:
BASEMAP DERIVED FROM; LOCUS TECHNOLOGIES, LOT
FIGURE A, DRAWING NO. 22–028–A6 AND ENV AMER
FIGURE 5, PROJECT NO. SCG–01–T022

FIGURE 2.1.2
RINA DEL REY PROPERTY CLUSTER (#12)
PHASE II SOIL SAMPLE RESULTS

N CALIFORNIA GAS COMPANY
Y AVENUE AND UNION JACK
YA DEL REY, CALIFORNIA

DATE	PROJECT NUMBER
MAR 2004	23483

BROWN AND CALDWELL
IRVINE, CALIFORNIA

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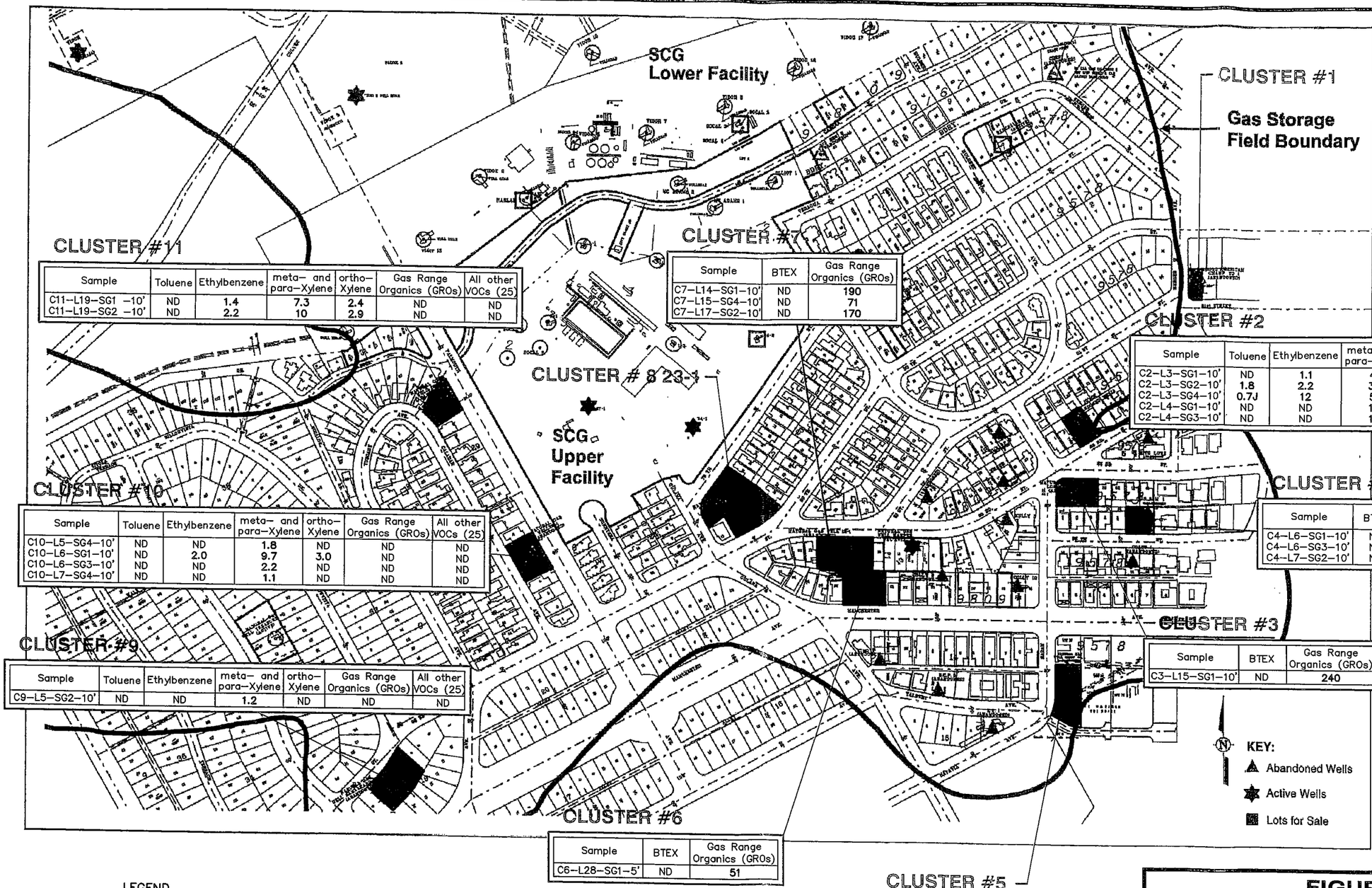

Sample	Toluene	Ethylbenzene	meta– and para–Xylene	ortho–Xylene	Gas Range Organics (GROs)	All other VOCs (25)
C11–L19–SG1 –10'	ND	1.4	7.3	2.4	ND	ND
C11–L19–SG2 –10'	ND	2.2	10	2.9	ND	ND

Sample	BTEX	Gas Range Organics (GROs)
C7–L14–SG1–10'	ND	190
C7–L15–SG4–10'	ND	71
C7–L17–SG2–10'	ND	170

Sample	Toluene	Ethylbenzene	meta– and para–Xylene	ortho–Xylene	Gas Range Organics (GROs)	All other VOCs (25)
C2–L3–SG1–10'	ND	1.1	4.1	1.0	ND	ND
C2–L3–SG2–10'	1.8	2.2	3.9	1.2	ND	ND
C2–L3–SG4–10'	0.7J	12	54	16	140	ND
C2–L4–SG1–10'	ND	ND	1.0	ND	ND	ND
C2–L4–SG3–10'	ND	ND	1.6	ND	ND	ND

Sample	Toluene	Ethylbenzene	meta– and para–Xylene	ortho–Xylene	Gas Range Organics (GROs)	All other VOCs (25)
C10–L5–SG4–10'	ND	ND	1.8	ND	ND	ND
C10–L6–SG1–10'	ND	2.0	9.7	3.0	ND	ND
C10–L6–SG3–10'	ND	ND	2.2	ND	ND	ND
C10–L7–SG4–10'	ND	ND	1.1	ND	ND	ND

Sample	BTEX	Gas Range Organics (GROs)
C4–L6–SG1–10'	ND	73
C4–L6–SG3–10'	ND	110
C4–L7–SG2–10'	ND	57

Sample	BTEX	Gas Range Organics (GROs)
C3–L15–SG1–10'	ND	240

Sample	Toluene	Ethylbenzene	meta– and para–Xylene	ortho–Xylene	Gas Range Organics (GROs)	All other VOCs (25)
C9–L5–SG2–10'	ND	ND	1.2	ND	ND	ND

Sample	BTEX	Gas Range Organics (GROs)
C6–L28–SG1–5'	ND	51

LEGEND

BTEX BENZENE, TOLUENE, ETHYLBENZENE, AND TOTAL XYLENES

ND NOT DETECTED ABOVE DETECTION LIMIT

SCG SOUTHERN CALIFORNIA GAS

VOCs VOLATILE ORGANIC COMPOUNDS

NOTE:
RESULTS ARE IN PARTS PER BILLION VOLUME (ppbV)

FIGURE 2.2.1
PLAYA DEL REY PROPERTY CLUSTERS (#1-#11)
PHASE I SOIL VAPOR SURVEY RESULTS
(SAMPLES WITH DETECTIONS ONLY)

PROJECT LOCATION	DATE	PROJECT NUMBER
PLAYA DEL REY, CALIFORNIA	MAR 2004	23483

BROWN AND CALDWELL
IRVINE, CALIFORNIA

3/17/04 06:45pm
17x11 | Ref Files : FIGURE 1-2.jpg
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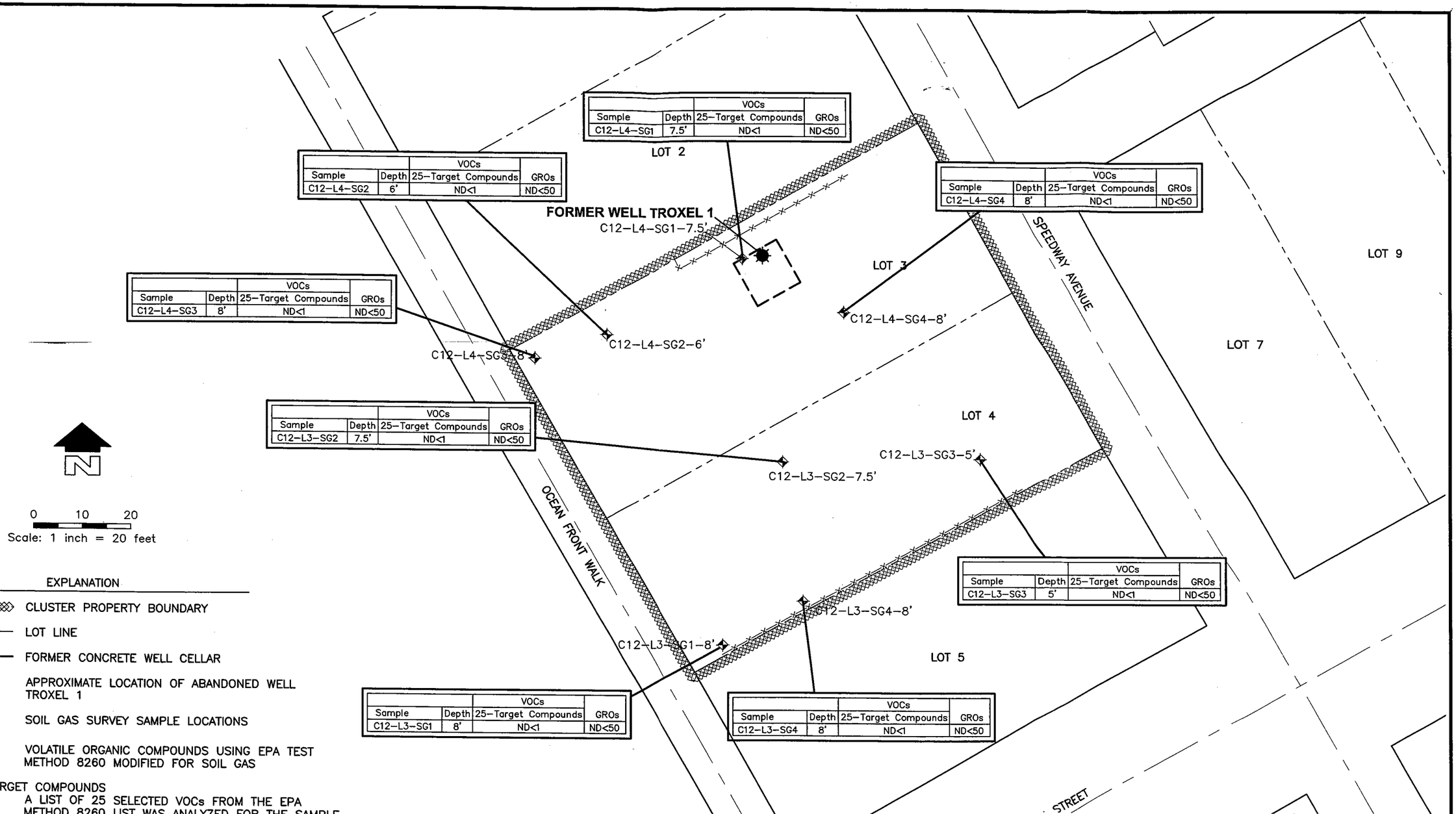

Sample	Depth	VOCs 25-Target Compounds	GROs
C12-L4-SG1	7.5'	ND<1	ND<50

Sample	Depth	VOCs 25-Target Compounds	GROs
C12-L4-SG2	6'	ND<1	ND<50

Sample	Depth	VOCs 25-Target Compounds	GROs
C12-L4-SG4	8'	ND<1	ND<50

Sample	Depth	VOCs 25-Target Compounds	GROs
C12-L4-SG3	8'	ND<1	ND<50

Sample	Depth	VOCs 25-Target Compounds	GROs
C12-L3-SG2	7.5'	ND<1	ND<50

Sample	Depth	VOCs 25-Target Compounds	GROs
C12-L3-SG3	5'	ND<1	ND<50

Sample	Depth	VOCs 25-Target Compounds	GROs
C12-L3-SG1	8'	ND<1	ND<50

Sample	Depth	VOCs 25-Target Compounds	GROs
C12-L3-SG4	8'	ND<1	ND<50

EXPLANATION

- CLUSTER PROPERTY BOUNDARY
- LOT LINE
- FORMER CONCRETE WELL CELLAR
- APPROXIMATE LOCATION OF ABANDONED WELL TROXEL 1
- SOIL GAS SURVEY SAMPLE LOCATIONS

VOCs — VOLATILE ORGANIC COMPOUNDS USING EPA TEST METHOD 8260 MODIFIED FOR SOIL GAS

25-TARGET COMPOUNDS — A LIST OF 25 SELECTED VOCs FROM THE EPA METHOD 8260 LIST WAS ANALYZED FOR THE SAMPLE

GROs — GAS RANGE ORGANICS USING EPA TEST METHOD 8015 MODIFIED FOR GASOLINE RANGE ORGANICS

ppbV — PARTS PER BILLION VOLUME

ND<1 — ANALYTE NON DETECTED ABOVE THE REPORTED LIMIT OF QUANTITATION

SOURCE:
BASEMAP DERIVED FROM; LOCUS TECHNOLOGIES, LOT NO. 3 AND 4, SPEEDWAY AVENUE, FIGURE A, DRAWING NO. 22-028-A6 AND ENV AMERICA, SOIL SAMPLE LOCATION MAP, FIGURE 5, PROJECT NO. SCG-01-T022

FIGURE 2.2.2
MARINA DEL REY PROPERTY CLUSTER (#12)
PHASE I SOIL VAPOR SURVEY RESULTS

PROJECT LOCATION	DATE	PROJECT NUMBER
SOUTHERN CALIFORNIA GAS COMPANY SPEEDWAY AVENUE AND UNION JACK PLAYA DEL REY, CALIFORNIA	MAR 2004	23483

BROWN AND CALDWELL
IRVINE, CALIFORNIA

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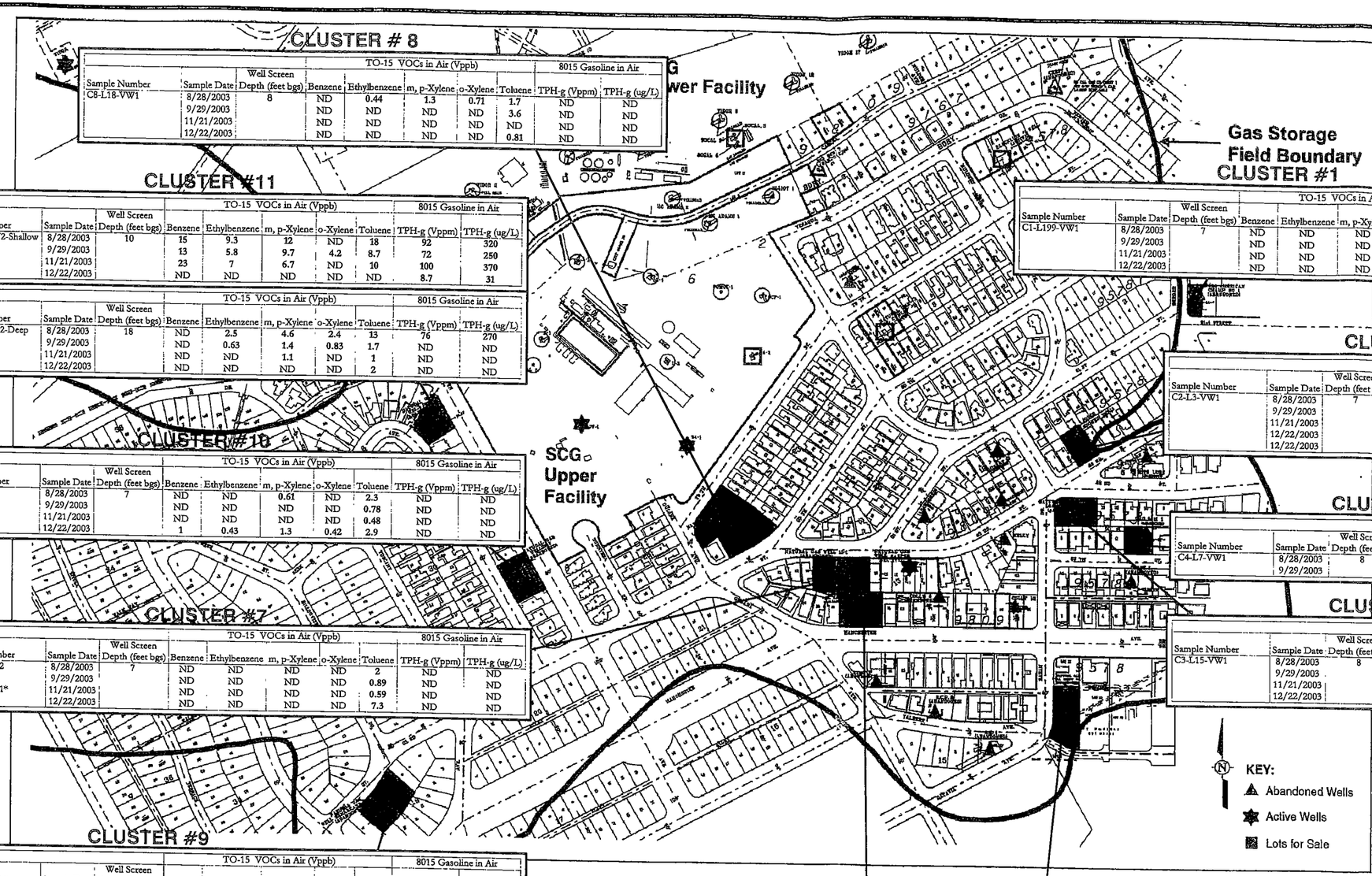

CLUSTER # 8

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C8-L18-VW1	8/28/2003	8	ND	0.44	1.3	0.71	1.7	ND	ND
	9/29/2003		ND	ND	ND	ND	3.6	ND	ND
	11/21/2003		ND	ND	ND	ND	ND	ND	ND
	12/22/2003		ND	ND	ND	ND	0.81	ND	ND

CLUSTER #11

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C11-L19-VW2-Shallow	8/28/2003	10	15	9.3	12	ND	18	92	320
	9/29/2003		13	5.8	9.7	4.2	8.7	72	250
	11/21/2003		23	7	6.7	ND	10	100	370
	12/22/2003		ND	ND	ND	ND	ND	8.7	31

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C11-L19-VW2-Deep	8/28/2003	18	ND	2.5	4.6	2.4	13	76	270
	9/29/2003		ND	0.63	1.4	0.83	1.7	ND	ND
	11/21/2003		ND	ND	1.1	ND	1	ND	ND
	12/22/2003		ND	ND	ND	ND	2	ND	ND

CLUSTER #10

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C10-L6-VW1	8/28/2003	7	ND	ND	0.61	ND	2.3	ND	ND
	9/29/2003		ND	ND	ND	ND	0.78	ND	ND
	11/21/2003		ND	ND	ND	ND	0.48	ND	ND
	12/22/2003		1	0.43	1.3	0.42	2.9	ND	ND

CLUSTER #7

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C7-L16-VW2	8/28/2003	7	ND	ND	ND	ND	2	ND	ND
	9/29/2003		ND	ND	ND	ND	0.89	ND	ND
C7-L16-VW1*	11/21/2003		ND	ND	ND	ND	0.59	ND	ND
	12/22/2003		ND	ND	ND	ND	7.3	ND	ND

CLUSTER #9

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C9-L5-VW1	8/28/2003	8	ND	ND	0.41	ND	3	ND	ND
	9/29/2003		ND	ND	0.54	ND	1.3	ND	ND
	11/21/2003		ND	ND	ND	ND	0.58	ND	ND
	12/22/2003		ND	ND	ND	ND	1.1	ND	ND

CLUSTER #1

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C1-L199-VW1	8/28/2003	7	ND	ND	ND	ND	2.6	ND	ND
	9/29/2003		ND	ND	ND	ND	1.2	ND	ND
	11/21/2003		ND	ND	ND	ND	0.61	ND	ND
	12/22/2003		ND	ND	ND	ND	ND	8.2	ND

CLUSTER #2

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C2-L3-VW1	8/28/2003	7	ND	ND	ND	ND	ND	53	190
	9/29/2003		ND	ND	ND	ND	1.9	ND	ND
	11/21/2003		ND	ND	ND	ND	0.61	ND	ND
	12/22/2003		ND	ND	ND	ND	1.2	ND	ND
	12/22/2003		0.59	0.42	1.1	0.39	9.3	ND	ND

CLUSTER #4

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C4-L7-VW1	8/28/2003	8	ND	0.71	1.2	0.88	5.2	ND	ND
	9/29/2003		ND	ND	0.44	0.39	1.5	ND	ND

CLUSTER #3

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C3-L15-VW1	8/28/2003	8	ND	0.63	1.2	0.58	5.2	ND	ND
	9/29/2003		ND	0.38	0.71	0.34	2.5	ND	ND
	11/21/2003		ND	ND	0.54	ND	1	ND	ND
	12/22/2003		ND	0.53	2	0.72	3.1	ND	ND

CLUSTER #6

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C6-L29-VW1	8/28/2003	10	ND	ND	0.73	ND	2.3	ND	ND
	9/29/2003		ND	0.61	2.2	ND	1.1	ND	ND

CLUSTER #5

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs in Air (Vppb) Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	8015 Gasoline in Air TPH-g (Vppm)	TPH-g (ug/L)
C5-L11-VW1	8/28/2003	7	ND	0.77	1.1	0.55	4.6	ND	ND
	9/29/2003		ND	0.43	0.78	0.42	2.1	ND	ND

LEGEND

BTEX BENZENE, TOLUENE, ETHYLBENZENE, AND TOTAL XYLENES
bgs BELOW GROUND SURFACE
TPH–g TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
TO–15 VOCs IN AIR
EPA METHOD TO–15 FOR VOLATILE ORGANIC COMPOUNDS IN AIR
8015 GASOLINE IN AIR
EPA METHOD 8015 FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE IN AIR

NOTE:
RESULTS ARE IN PARTS PER BILLION VOLUME (Vppb), PARTS PER MILLION VOLUME (Vppm), OR MICROGRAMS PER LITER (µg/L)

* C7–L16–VW1–VW2 WERE COLLECTED FROM THE SAME POINT AND MISLABELED

FIGURE 2.2.3

PLAYA DEL REY PROPERTY CLUSTERS (#1-#11) PHASE II OF SOIL GAS MONITORING RESULTS WELLS (DETECTIONS ONLY)

PROJECT LOCATION	DATE	PROJECT NUMBER
PLAYA DEL REY, CALIFORNIA	MAR 2004	23483

BROWN AND CALDWELL
IRVINE, CALIFORNIA

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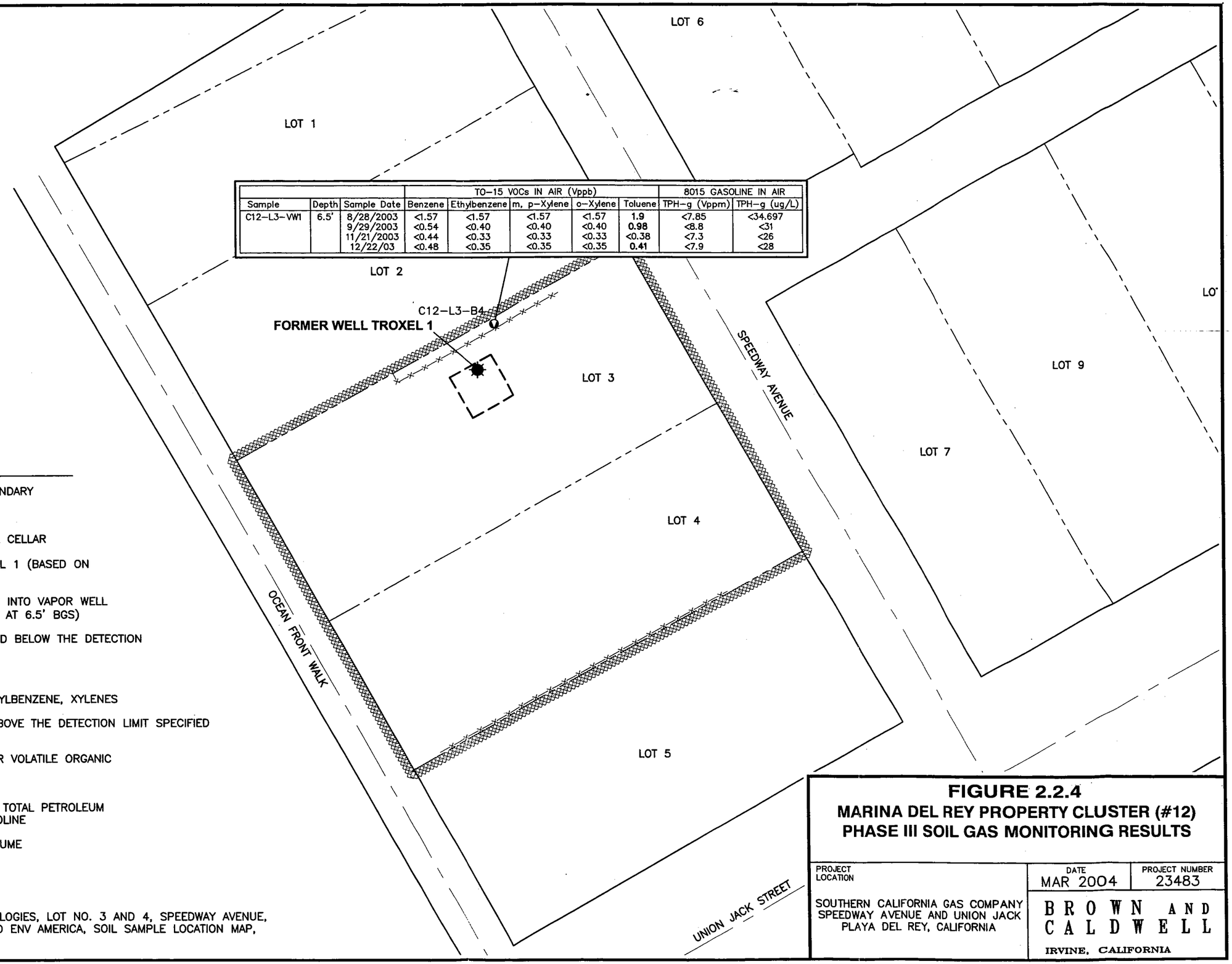

			TO-15 VOCs IN AIR (Vppb)					8015 GASOLINE IN AIR	
Sample	Depth	Sample Date	Benzene	Ethylbenzene	m, p-Xylene	o-Xylene	Toluene	TPH-g (Vppm)	TPH-g (ug/L)
C12-L3-VW1	6.5'	8/28/2003	<1.57	<1.57	<1.57	<1.57	**1.9**	<7.85	<34.697
		9/29/2003	<0.54	<0.40	<0.40	<0.40	**0.98**	<8.8	<31
		11/21/2003	<0.44	<0.33	<0.33	<0.33	<0.38	<7.3	<26
		12/22/03	<0.48	<0.35	<0.35	<0.35	**0.41**	<7.9	<28

EXPLANATION

- CLUSTER PROPERTY BOUNDARY
- LOT LINE
- FORMER CONCRETE WELL CELLAR
- ABANDONED WELL TROXEL 1 (BASED ON GEOPHYSICAL SURVEY)
- SOIL BORING CONVERTED INTO VAPOR WELL C12-L3-VW-1 (IMPLANT AT 6.5' BGS)
- J — CONCENTRATION DETECTED BELOW THE DETECTION LIMIT
- – — SAMPLE NOT ANALYZED
- BTEX — BENZENE, TOLUENE, ETHYLBENZENE, XYLENES
- <1.57 — NOT DETECTED AT OR ABOVE THE DETECTION LIMIT SPECIFIED
- TO-15 VOCs IN AIR — EPA METHOD TO-15 FOR VOLATILE ORGANIC COMPOUNDS IN AIR
- 8015 GASOLINE IN AIR — EPA METHOD 8015 FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
- Vppm — PARTS PER MILLION VOLUME
- µg/L — MICROGRAMS PER LITER

SOURCE:
BASEMAP DERIVED FROM; LOCUS TECHNOLOGIES, LOT NO. 3 AND 4, SPEEDWAY AVENUE, FIGURE A, DRAWING NO. 22-028-A6 AND ENV AMERICA, SOIL SAMPLE LOCATION MAP, FIGURE 5, PROJECT NO. SCG-01-T022

FIGURE 2.2.4
MARINA DEL REY PROPERTY CLUSTER (#12) PHASE III SOIL GAS MONITORING RESULTS

PROJECT LOCATION	DATE	PROJECT NUMBER
SOUTHERN CALIFORNIA GAS COMPANY SPEEDWAY AVENUE AND UNION JACK PLAYA DEL REY, CALIFORNIA	MAR 2004	23483

BROWN AND CALDWELL
IRVINE, CALIFORNIA

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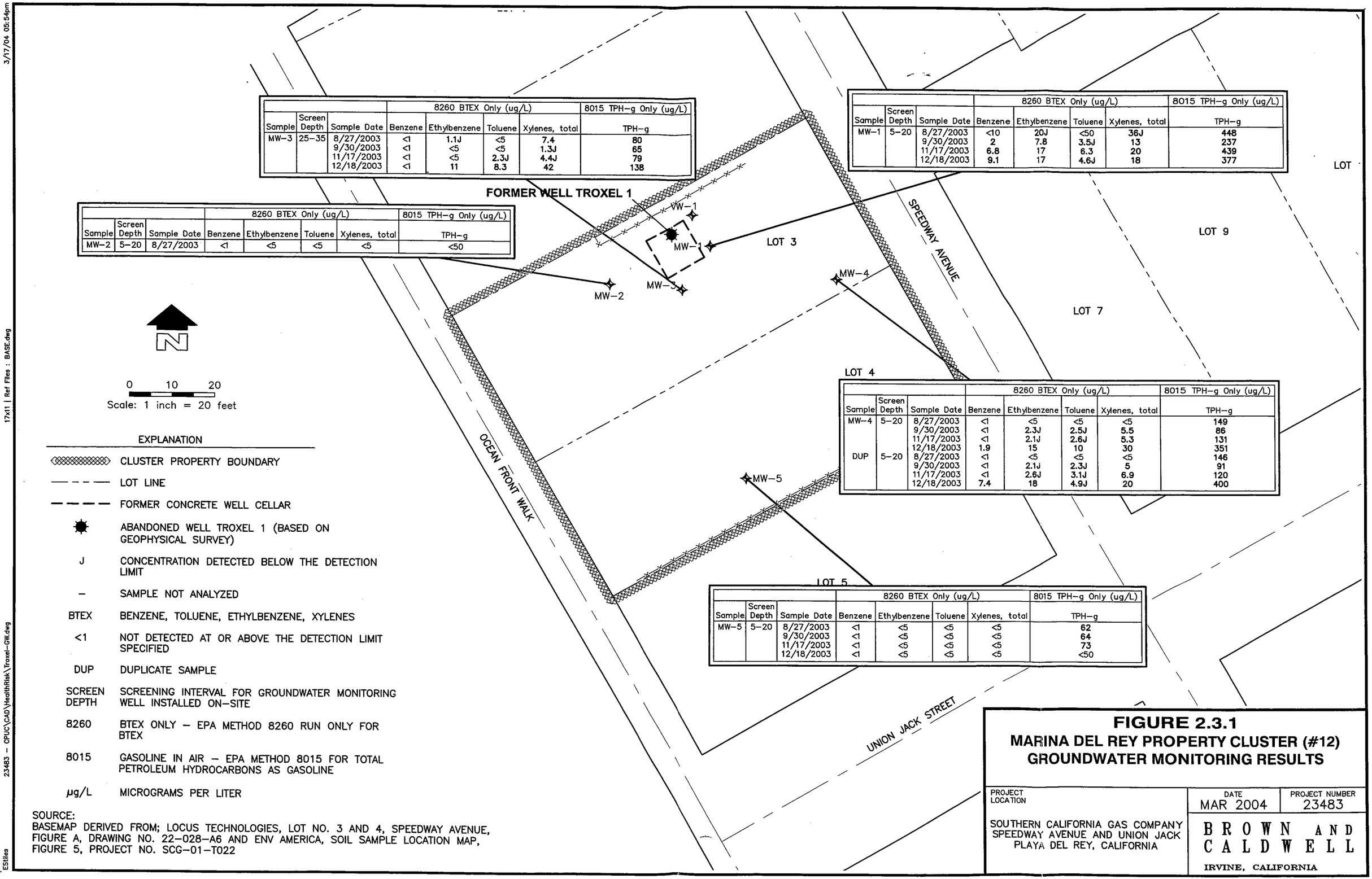

			8260 BTEX Only (ug/L)				8015 TPH-g Only (ug/L)
Sample	Screen Depth	Sample Date	Benzene	Ethylbenzene	Toluene	Xylenes, total	TPH-g
MW-3	25-35	8/27/2003	<1	1.1J	<5	7.4	80
		9/30/2003	<1	<5	<5	1.3J	65
		11/17/2003	<1	<5	2.3J	4.4J	79
		12/18/2003	<1	11	8.3	42	138

			8260 BTEX Only (ug/L)				8015 TPH-g Only (ug/L)
Sample	Screen Depth	Sample Date	Benzene	Ethylbenzene	Toluene	Xylenes, total	TPH-g
MW-2	5-20	8/27/2003	<1	<5	<5	<5	<50

			8260 BTEX Only (ug/L)				8015 TPH-g Only (ug/L)
Sample	Screen Depth	Sample Date	Benzene	Ethylbenzene	Toluene	Xylenes, total	TPH-g
MW-1	5-20	8/27/2003	<10	20J	<50	36J	448
		9/30/2003	2	7.8	3.5J	13	237
		11/17/2003	6.8	17	6.3	20	439
		12/18/2003	9.1	17	4.6J	18	377

			8260 BTEX Only (ug/L)				8015 TPH-g Only (ug/L)
Sample	Screen Depth	Sample Date	Benzene	Ethylbenzene	Toluene	Xylenes, total	TPH-g
MW-4	5-20	8/27/2003	<1	<5	<5	<5	149
		9/30/2003	<1	2.3J	2.5J	5.5	86
		11/17/2003	<1	2.1J	2.6J	5.3	131
		12/18/2003	1.9	15	10	30	351
DUP	5-20	8/27/2003	<1	<5	<5	<5	146
		9/30/2003	<1	2.1J	2.3J	5	91
		11/17/2003	<1	2.6J	3.1J	6.9	120
		12/18/2003	7.4	18	4.9J	20	400

			8260 BTEX Only (ug/L)				8015 TPH-g Only (ug/L)
Sample	Screen Depth	Sample Date	Benzene	Ethylbenzene	Toluene	Xylenes, total	TPH-g
MW-5	5-20	8/27/2003	<1	<5	<5	<5	62
		9/30/2003	<1	<5	<5	<5	64
		11/17/2003	<1	<5	<5	<5	73
		12/18/2003	<1	<5	<5	<5	<50

EXPLANATION

- CLUSTER PROPERTY BOUNDARY
- LOT LINE
- FORMER CONCRETE WELL CELLAR
- ABANDONED WELL TROXEL 1 (BASED ON GEOPHYSICAL SURVEY)
- J — CONCENTRATION DETECTED BELOW THE DETECTION LIMIT
- – — SAMPLE NOT ANALYZED
- BTEX — BENZENE, TOLUENE, ETHYLBENZENE, XYLENES
- <1 — NOT DETECTED AT OR ABOVE THE DETECTION LIMIT SPECIFIED
- DUP — DUPLICATE SAMPLE
- SCREEN DEPTH — SCREENING INTERVAL FOR GROUNDWATER MONITORING WELL INSTALLED ON-SITE
- 8260 — BTEX ONLY – EPA METHOD 8260 RUN ONLY FOR BTEX
- 8015 — GASOLINE IN AIR – EPA METHOD 8015 FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
- µg/L — MICROGRAMS PER LITER

SOURCE:
BASEMAP DERIVED FROM; LOCUS TECHNOLOGIES, LOT NO. 3 AND 4, SPEEDWAY AVENUE, FIGURE A, DRAWING NO. 22-028-A6 AND ENV AMERICA, SOIL SAMPLE LOCATION MAP, FIGURE 5, PROJECT NO. SCG-01-T022

FIGURE 2.3.1
MARINA DEL REY PROPERTY CLUSTER (#12) GROUNDWATER MONITORING RESULTS

PROJECT LOCATION	DATE	PROJECT NUMBER
SOUTHERN CALIFORNIA GAS COMPANY SPEEDWAY AVENUE AND UNION JACK PLAYA DEL REY, CALIFORNIA	MAR 2004	23483

BROWN AND CALDWELL
IRVINE, CALIFORNIA

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APPENDIX A

LABORATORY DATA

1. Soil Samples Collected from Surface to 15 foot Depth at All Clusters
2. Soil Samples Collected from All Depths at All Clusters
3. Vapor Samples Collected from Temporary Sampling Points
4. Vapor Samples Collected from Permanent Vapor Monitoring Wells
5. Groundwater Samples Collected from Cluster 12

Table 1
Soil Samples Collected from Surface to 15 feet depth at All Clusters

Sample ID	Sample Date	Depth (feet)	8015 (Carbon Chain Identification)			8260B (BTEX Only)				8015M	8260	8270
			C6-C10 ppm	C10-C22 ppm	C22-C36 ppm	Benzene ppm	Toluene ppm	Ethylbenzene ppm	Xylenes ppm	Gasoline ppm	All VOCs	All SVOCs
C1-L199-B1-5	07/10/03	5.0	<3.0	**170**	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C3-L15-B1-5	07/09/03	5.0	<3.0	<3.0	**280**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C6-L29-B1-5	07/15/03	5.0	<300	<300	**770**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L23-B1-5	07/15/03	5.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L23-B3-5	07/15/03	5.0	**12**	<3.0	**7.0**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L5-B1-5	07/10/03	5.0	<15	<15	**52**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L7-B2-5	07/14/03	5.0	<30	**300**	<50	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B2-5	07/21/03	5.0	<3.0	<3.0	**5.0**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L4-B3-5	07/22/03	5.0	<60	<60	**130**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B6-5	07/22/03	5.0	<150	<150	**470**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C6-L29-B3-8.5	7/16/2003	8.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L15-B4-8.5	07/16/03	8.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L14-B5-8.5	07/16/03	8.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C3-L16-B2-10	07/09/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C3-L14-B3-10	07/09/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C4-L6-B2-10	07/09/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C5-L11-B1-10	07/10/03	10.0	<3.0	**3.0**	**10**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C6-L28-B2-10	07/15/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L16-B2-10	07/14/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L24-B2-10	07/15/03	10.0	**9**	<3.0	**8.3**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L19-B4-10	07/15/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L20-B6-10	07/15/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L7-B3-10	07/10/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L6-B1-10	07/14/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L5-B3-10	07/14/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C11-L19-B1-10	07/11/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C11-L19-B2-10	07/11/03	10.0	<60	<60	**207**	<0.005	<0.005	<0.005	<0.005	<3.0	ND	ND
C12-L3-B1-10	07/21/03	10.0	<150	<150	**721**	<0.005	<0.005	<0.005	<0.005	<3.0	ND	ND
C12-L3-B2-10	07/21/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	ND	ND
C12-L4-B3-10	07/22/03	10.0	<3.0	<3.0	**9.0**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C6-L28-B2-DUP	07/15/03	11.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L19-B4-DUP	07/15/03	11.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--

Table 1
Soil Samples Collected from Surface to 15 feet depth at All Clusters

Sample ID	Sample Date	Depth (feet)	8015 (Carbon Chain Identification)			8260B (BTEX Only)				8015M	8260	8270
			C6-C10 ppm	C10-C22 ppm	C22-C36 ppm	Benzene ppm	Toluene ppm	Ethylbenzene ppm	Xylenes ppm	Gasoline ppm	All VOCs	All SVOCs
C10-L5-B3-DUP	07/14/03	11.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B2-DUP	07/21/03	11.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	ND	ND
C7-L15-B3-13.5	07/16/03	13.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L8-B4-13.5	07/16/03	13.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C2-L3-B1-15	07/11/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C2-L3-B3-15	07/11/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C4-L7-B1-15	07/09/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L15-B1-15	07/14/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L15-B3-DUP	07/16/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L23-B1-15	07/15/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L18-B5-15	07/15/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L6-B2-15	07/10/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L8-B4-DUP	07/16/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C11-L19-B2-15	07/11/03	15.0	<30	<30	**136**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B1-15	07/21/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B6-15	07/22/03	15.0	**9.0**	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
Data Summary												
Minimum			9	3	5	0	0	0	0	0	0	0
Maximum			12	300	770	0	0	0	0	0	0	0
Depth of Max			5	5	5	NA	NA	NA	NA	NA	NA	NA
Number of Samples			48	48	48	48	48	48	48	48	4	4
Number of Positive Detections			3	3	13	0	0	0	0	0	0	0

ppm = parts per million
-- = Sample not analyzed
ND = Not detected

Table 2
Soil Samples Collected from All Depths at All Clusters

Sample ID	Sample Date	Depth (feet)	8015 (Carbon Chain Identification)			8260B (BTEX Only)				8015M	8260	8270
			C6-C10 ppm	C10-C22 ppm	C22-C36 ppm	Benzene ppm	Toluene ppm	Ethylbenzene ppm	Xylenes ppm	Gasoline ppm	All VOCs	All SVOCs
C1-L199-B1-5	07/10/03	5.0	<3.0	**170**	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C1-L199-B1-30	07/10/03	30.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C2-L3-B1-15	07/11/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C2-L3-B1-30	07/11/03	30.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C2-L4-B2-20	07/11/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C2-L3-B3-DUP	07/11/03	16.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C2-L3-B3-15	07/11/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C2-L3-B3-20	07/11/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C3-L15-B1-5	07/09/03	5.0	<3.0	<3.0	**280**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C3-L15-B1-20	07/09/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C3-L16-B2-10	07/09/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C3-L16-B2-20	07/09/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C3-L14-B3-10	07/09/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C3-L14-B3-20	07/09/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C4-L7-B1-15	07/09/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C4-L7-B1-30	07/09/03	30.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C4-L6-B2-10	07/09/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C4-L6-B2-20	07/09/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C5-L11-B1-10	07/10/03	10.0	<3.0	**3.0**	**10**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C6-L29-B1-5	07/15/03	5.0	<300	<300	**770**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C6-L29-B1-30	07/15/03	30.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C6-L28-B2-10	07/15/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C6-L28-B2-DUP	07/15/03	11.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C6-L28-B2-20	07/15/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C6-L29-B3-8.5	7/16/2003	8.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C6-L29-B3-18.5	7/16/2003	18.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L15-B1-15	07/14/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L15-B1-20	07/14/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L16-B2-10	07/14/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L16-B2-30	07/14/03	30.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L15-B3-13.5	07/16/03	13.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L15-B3-DUP	07/16/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--

Table 2
Soil Samples Collected from All Depths at All Clusters

Sample ID	Sample Date	Depth (feet)	8015 (Carbon Chain Identification)			8260B (BTEX Only)				8015M	8260	8270
			C6-C10 ppm	C10-C22 ppm	C22-C36 ppm	Benzene ppm	Toluene ppm	Ethylbenzene ppm	Xylenes ppm	Gasoline ppm	All VOCs	All SVOCs
C7-L15-B3-18.5	07/16/03	18.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L15-B4-8.5	07/16/03	8.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L15-B4-18.5	07/16/03	18.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C7-L14-B5-8.5	07/16/03	8.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L23-B1-5	07/15/03	5.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L23-B1-15	07/15/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L24-B2-10	07/15/03	10.0	**9**	<3.0	**8.3**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L24-B2-20	07/15/03	20.0	<3.0	<3.0	**8.0**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L23-B3-5	07/15/03	5.0	**12**	<3.0	**7.0**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L23-B3-20	07/15/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L18-B5-15	07/15/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L18-B5-30	07/15/03	30.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L19-B4-DUP	07/15/03	11.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L19-B4-10	07/15/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L19-B4-20	07/15/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L20-B6-10	07/15/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C8-L20-B6-20	07/15/03	20	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L5-B1-5	07/10/03	5.0	<15	<15	**52**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L5-B1-30	07/10/03	30.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L6-B2-15	07/10/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L6-B2-20	07/10/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L7-B3-10	07/10/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L7-B3-30	07/10/03	30.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L8-B4-13.5	07/16/03	13.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L8-B4-DUP	07/16/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C9-L8-B4-18.5	07/16/03	18.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L6-B1-10	07/14/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L6-B1-30	07/14/03	30.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L7-B2-5	07/14/03	5.0	<30	**300**	<50	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L7-B2-20	07/14/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L5-B3-10	07/14/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L5-B3-DUP	07/14/03	11.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--

Table 2
Soil Samples Collected from All Depths at All Clusters

Sample ID	Sample Date	Depth (feet)	8015 (Carbon Chain Identification)			8260B (BTEX Only)				8015M	8260	8270
			C6-C10 ppm	C10-C22 ppm	C22-C36 ppm	Benzene ppm	Toluene ppm	Ethylbenzene ppm	Xylenes ppm	Gasoline ppm	All VOCs	All SVOCs
C10-L5-B3-20	07/14/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L6-B4-20	07/21/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L6-B4-30	07/21/03	30.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C10-L6-B4-60	07/21/03	60.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C11-L19-B1-10	07/11/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C11-L19-B1-30	07/11/03	30.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C11-L19-B2-10	07/11/03	10.0	<60	<60	**207**	<0.005	<0.005	<0.005	<0.005	<3.0	ND	ND
C11-L19-B2-15	07/11/03	15.0	<30	<30	**136**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C11-L19-B2-DUP	07/11/03	16.5	<30	<30	**106**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C11-L19-B3-20	07/11/03	20.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B1-10	07/21/03	10.0	<150	<150	**721**	<0.005	<0.005	<0.005	<0.005	<3.0	ND	ND
C12-L3-B1-15	07/21/03	15.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B2-5	07/21/03	5.0	<3.0	<3.0	**5.0**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B2-10	07/21/03	10.0	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	ND	ND
C12-L3-B2-DUP	07/21/03	11.5	<3.0	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	ND	ND
C12-L4-B3-5	07/22/03	5.0	<60	<60	**130**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L4-B3-10	07/22/03	10.0	<3.0	<3.0	**9.0**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B5-25	07/22/03	25.0	**5.0**	<3.0	**5.0**	<0.005	<0.005	<0.005	<0.005	<3.0	ND	ND
C12-L3-B5-30	07/22/03	30.0	**6.0**	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B5-33	07/22/03	33.0	**12**	<3.0	**6.0**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B6-5	07/22/03	5.0	<150	<150	**470**	<0.005	<0.005	<0.005	<0.005	<3.0	--	--
C12-L3-B6-15	07/22/03	15.0	**9.0**	<3.0	<5.0	<0.005	<0.005	<0.005	<0.005	<3.0	--	--

ppm = parts per million
-- = samlpe not analyzed
ND = not detected

Table 3
Vapor Samples Collected from Temporary Sampling Points

Sample Number	Sample Date	Sample Depth	8260 VOCs					8015 TPH
			Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	meta- and para-Xylene µg/L	ortho-Xylene µg/L	Gas Range Organics (GROs) µg/L
C1-L18-SG2-10'	6/16/2003	10	<1	<1	<1	<1	<1	<50
C1-L199-SG1-10'	6/13/2003	10	<1	<1	<1	<1	<1	<50
C1-L199-SG2-10' **	6/13/2003	10	<1	<1	<1	<1	<1	<50
		10	<1	<1	<1	<1	<1	<50
		10	<1	<1	<1	<1	<1	<50
C1-L199-SG3-5'	6/13/2003	5	<1	<1	<1	<1	<1	<50
C1-L199-SG4-5'	6/13/2003	5	<1	<1	<1	<1	<1	<50
C2-L3-SG1-10'	6/6/2003	10	<1	<1	**1.1**	**4.1**	**1**	<50
C2-L3-SG2-10'	6/5/2003	10	<1	**1.8**	**2.2**	**3.9**	**1.2**	<50
C2-L3-SG3-10'	6/6/2003	10	<1	<1	<1	<1	<1	<50
C2-L3-SG4-10' *	6/5/2003	10	<1	**0.6**	**12**	**56**	**16**	**160**
		10	<1	**0.7**	**12**	**54**	**16**	**140**
		10	<1	**0.6**	**9.1**	**41**	**14**	**110**
C2-L4-SG1-10'	6/6/2003	10	<1	<1	<1	**1.0**	<1	<50
C2-L4-SG2-10'	6/6/2003	10	<1	<1	<1	<1	<1	<50
C2-L4-SG3-10'	6/5/2003	10	<1	<1	<1	**1.6**	<1	<50
C2-L4-SG3-10' **	6/5/2003	10	<1	<1	<1	**1.5**	<1	<50
C2-L4-SG4-10'	6/6/2003	10	<1	<1	<1	<1	<1	<50
C3-L14-SG1-10'	6/17/2003	10	<1	<1	<1	<1	<1	<50
C3-L14-SG2-10'	6/17/2003	10	<1	<1	<1	<1	<1	<50
C3-L14-SG2-10'**	6/17/2003	10	<1	<1	<1	<1	<1	<50
C3-L14-SG3-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C3-L14-SG3-10' **	6/18/2003	10	<1	<1	<1	<1	<1	<50
C3-L14-SG4-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C3-L15-SG1-10' *	6/17/2003	10	<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	**240**
			<1	<1	<1	<1	<1	**130**
C3-L15-SG2-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C3-L15-SG3-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C3-L15-SG4-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C3-L16-SG1-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C3-L16-SG2-10'	6/17/2003	10	<1	<1	<1	<1	<1	<50
C3-L16-SG3-10'	6/17/2003	10	<1	<1	<1	<1	<1	<50

Table 3
Vapor Samples Collected from Temporary Sampling Points

Sample Number	Sample Date	Sample Depth	8260 VOCs					8015 TPH
			Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	meta- and para-Xylene µg/L	ortho-Xylene µg/L	Gas Range Organics (GROs) µg/L
C3-L16-SG4-6'	6/17/2003	10	<1	<1	<1	<1	<1	<50
C4-L6-SG1-10'	6/18/2003	10	<1	<1	<1	<1	<1	**73**
C4-L6-SG2-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C4-L6-SG3-10'	6/18/2003	10	<1	<1	<1	<1	<1	**110**
C4-L6-SG4-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C4-L7-SG1-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C4-L7-SG2-10' *	6/18/2003	10	<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	**57**
C4-L7-SG3-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C4-L7-SG4-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C5-L11-SG1-10'	6/9/2003	10	<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
C5-L11-SG2-10'	6/9/2003	10	<1	<1	<1	<1	<1	<50
C5-L11-SG3-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C5-L11-SG4-10'	6/18/2003	10	<1	<1	<1	<1	<1	<50
C6-L28-SG1-5'	6/16/2003	5	<1	<1	<1	<1	<1	**51**
C6-L28-SG2-6'	6/17/2003	6	<1	<1	<1	<1	<1	<50
C6-L28-SG3-6'	6/17/2003	6	<1	<1	<1	<1	<1	<50
C6-L29-SG1-10'	6/16/2003	10	<1	<1	<1	<1	<1	<50
C6-L29-SG2-6'	6/16/2003	6	<1	<1	<1	<1	<1	<50
C6-L29-SG3-10'	6/16/2003	6	<1	<1	<1	<1	<1	<50
C6-L29-SG4-7'	6/17/2003	7	<1	<1	<1	<1	<1	<50
C6-L29-SG5-8'	6/17/2003	8	<1	<1	<1	<1	<1	<50
C6-L30-SG1-10'	6/17/2003	10	<1	<1	<1	<1	<1	<50
C6-L30-SG2-10'	6/17/2003	10	<1	<1	<1	<1	<1	<50
C6-L30-SG3-10'	6/17/2003	10	<1	<1	<1	<1	<1	<50
C7-L14-SG1-10'	6/16/2003	10	<1	<1	<1	<1	<1	**190**
C7-L14-SG2-10'	6/13/2003	10	<1	<1	<1	<1	<1	<50
C7-L15-SG1-6'	6/13/2003	6	<1	<1	<1	<1	<1	<50
C7-L15-SG2-10'	6/13/2003	10	<1	<1	<1	<1	<1	<50
C7-L15-SG3-10' **	6/13/2003	10	<1	<1	<1	<1	<1	<50

Table 3
Vapor Samples Collected from Temporary Sampling Points

Sample Number	Sample Date	Sample Depth	8260 VOCs					8015 TPH
			Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	meta- and para-Xylene µg/L	ortho-Xylene µg/L	Gas Range Organics (GROs) µg/L
C7-L15-SG3-10'	6/13/2003	10	<1	<1	<1	<1	<1	<50
C7-L15-SG4-10'	6/16/2003	10	<1	<1	<1	<1	<1	**71**
C7-L16-SG1-10'	6/13/2003	10	<1	<1	<1	<1	<1	<50
C7-L16-SG2-6' *	6/13/2003	6	<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
C7-L16-SG3-10'	6/13/2003	10	<1	<1	<1	<1	<1	<50
C7-L16-SG4-10'	6/13/2003	10	<1	<1	<1	<1	<1	<50
C7-L17-SG1-10'	6/16/2003	10	<1	<1	<1	<1	<1	<50
C7-L17-SG2-10' *	6/16/2003	10	<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	**170**
			<1	<1	<1	<1	<1	<50
C7-L17-SG3-10'	6/16/2003	10	<1	<1	<1	<1	<1	<50
C7-L17-SG4-10'	6/16/2003	10	<1	<1	<1	<1	<1	<50
C7-L18-SG1-10'	6/16/2003	10	<1	<1	<1	<1	<1	<50
C7-L18-SG1-10' **	6/16/2003	10	<1	<1	<1	<1	<1	<50
C7-L18-SG2-10'	6/16/2003	10	<1	<1	<1	<1	<1	<50
C8-L17-SG1-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L17-SG2-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L17-SG3-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L17-SG4-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L18-SG1-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L18-SG2-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L18-SG3-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L18-SG4-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50

Table 3
Vapor Samples Collected from Temporary Sampling Points

Sample Number	Sample Date	Sample Depth	8260 VOCs					8015 TPH
			Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	meta- and para-Xylene µg/L	ortho-Xylene µg/L	Gas Range Organics (GROs) µg/L
C8-L19-SG1-10' *	6/10/2003	10	<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
C8-L19-SG2-10'	6/10/2003	10	<1	<1	<1	<1	<1	<50
C8-L19-SG3-10'	6/10/2003	10	<1	<1	<1	<1	<1	<50
C8-L19-SG4-10'	6/10/2003	10	<1	<1	<1	<1	<1	<50
C8-L20-SG1-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L20-SG2-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L20-SG2-10' **	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L20-SG3-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L20-SG4-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L22-SG1-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L22-SG2-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L22-SG2-10' **	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L22-SG3-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L22-SG4-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L23-SG1-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L23-SG2-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L23-SG3-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L23-SG4-10'	6/11/2003	10	<1	<1	<1	<1	<1	<50
C8-L24-SG1-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L24-SG2-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L24-SG3-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C8-L24-SG4-10'	6/12/2003	10	<1	<1	<1	<1	<1	<50
C9-L5-SG1-10'	6/9/2003	10	<1	<1	<1	<1	<1	<50
C9-L5-SG2-10' *	6/9/2003	10	<1	<1	<1	<1	<1	<50
			<1	<1	<1	**1.2**	<1	<50
			<1	<1	<1	<1	<1	<50
C9-L5-SG3-10'	6/9/2003	10	<1	<1	<1	<1	<1	<50
C9-L5-SG4-10'	6/9/2003	10	<1	<1	<1	<1	<1	<50
C9-L6-SG1-10'	6/6/2003	10	<1	<1	<1	<1	<1	<50
C9-L6-SG1-10' **	6/6/2003	10	<1	<1	<1	<1	<1	<50
C9-L6-SG2-10'	6/9/2003	10	<1	<1	<1	<1	<1	<50

Table 3
Vapor Samples Collected from Temporary Sampling Points

Sample Number	Sample Date	Sample Depth	8260 VOCs					8015 TPH
			Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	meta- and para-Xylene µg/L	ortho-Xylene µg/L	Gas Range Organics (GROs) µg/L
C9-L6-SG3-10'	6/9/2003	10	<1	<1	<1	<1	<1	<50
C9-L7-SG1-10' *	6/6/2003	10	<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
C9-L7-SG2-10'	6/6/2003	10	<1	<1	<1	<1	<1	<50
C9-L7-SG3-10'	6/6/2003	10	<1	<1	<1	<1	<1	<50
C9-L7-SG4-10'	6/6/2003	10	<1	<1	<1	<1	<1	<50
C9-L8-SG1-10'	6/6/2003	10	<1	<1	<1	<1	<1	<50
C9-L8-SG2-10'	6/9/2003	10	<1	<1	<1	<1	<1	<50
C9-L8-SG3-10'	6/9/2003	10	<1	<1	<1	<1	<1	<50
C10-L5-SG1-10' *	6/4/2003	10	<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
C10-L5-SG2-10'	6/4/2003	10	<1	<1	<1	<1	<1	<50
C10-L5-SG3-10'	6/4/2003	10	<1	<1	<1	<1	<1	<50
C10-L5-SG4-10'	6/4/2003	10	<1	<1	<1	**1.8**	<1	<50
C10-L6-SG1-10' *	6/4/2003	10	<1	<1	**1.6**	**8.4**	**2.5**	<50
			<1	<1	**1.6**	**7.3**	**2.3**	<50
			<1	<1	**2.0**	**9.7**	**3.0**	<50
C10-L6-SG2-10'	6/4/2003	10	<1	<1	<1	<1	<1	<50
C10-L6-SG3-10'	6/4/2003	10	<1	<1	<1	**2.2**	<1	<50
C10-L6-SG3-10' **	6/4/2003	10	<1	<1	<1	**1.3**	<1	<50
C10-L6-SG4-10'	6/4/2003	10	<1	<1	<1	<1	<1	<50
C10-L7-SG1-10'	6/4/2003	10	<1	<1	<1	<1	<1	<50
C10-L7-SG2-10'	6/4/2003	10	<1	<1	<1	<1	<1	<50
C10-L7-SG3-10'	6/4/2003	10	<1	<1	<1	<1	<1	<50
C10-L7-SG4-10'	6/4/2003	10	<1	<1	<1	**1.1**	<1	<50
C11-L18-SG1 -10'	6/5/2003	10	<1	<1	<1	<1	<1	<50
C11-L18-SG2 -10'	6/5/2003	10	<1	<1	<1	<1	<1	<50

Table 3
Vapor Samples Collected from Temporary Sampling Points

Sample Number	Sample Date	Sample Depth	8260 VOCs					8015 TPH
			Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	meta- and para-Xylene µg/L	ortho-Xylene µg/L	Gas Range Organics (GROs) µg/L
C11-L19-SG1 -10'	6/5/2003	10	<1	<1	**1.4**	**7.3**	**2.4**	<50
C11-L19-SG2 -10' *	6/5/2003	10	<1	<1	**1.9**	**9.4**	**2.7**	<50
			<1	<1	**2.2**	**10**	**2.9**	<50
			<1	<1	**2.2**	**10**	**2.8**	<50
C11-L19-SG3 -10' *	6/5/2003	10	<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
C11-L19-SG4 -10'	6/5/2003	10	<1	<1	<1	<1	<1	<50
C11-L19-SG5 -10'	6/5/2003	10	<1	<1	<1	<1	<1	<50
C11-L19-SG6 -10'	6/5/2003	10	<1	<1	<1	<1	<1	<50
C11-L19-SG6 -10'**	6/5/2003	10	<1	<1	<1	<1	<1	<50
C12-L3-SG1-8' *	6/10/2003	10	<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
			<1	<1	<1	<1	<1	<50
C12-L3-SG2-7.5'	6/10/2003	10	<1	<1	<1	<1	<1	<50
C12-L3-SG3-5'	6/10/2003	10	<1	<1	<1	<1	<1	<50
C12-L3-SG4-8'	6/10/2003	10	<1	<1	<1	<1	<1	<50
C12-L4-SG1-7.5'	6/10/2003	10	<1	<1	<1	<1	<1	<50
C12-L4-SG2-6'	6/10/2003	10	<1	<1	<1	<1	<1	<50
C12-L4-SG3-8'	6/10/2003	10	<1	<1	<1	<1	<1	<50
C12-L4-SG3-8'	6/10/2003	10	<1	<1	<1	<1	<1	<50
C12-L4-SG4-8'**	6/10/2003	10	<1	<1	<1	<1	<1	<50
Data Summary								
Minimum			0	0.6	1.1	1	1	51
Maximum			0	1.8	12	56	16	240
Depth of Max			na	10	10	10	10	10
Number of Samples			175	175	175	175	175	175
Number of Positive Detections			0	4	12	20	12	12
Frequency of Detection			0%	2%	7%	11%	7%	7%

* Purge volume study
** Duplicate sample
µg/L - micrograms per liter

Table 4
Vapor Samples Collected from Permanent Vapor Monitoring Wells

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs						8015 Gasoline	
			Benzene vppb	Ethylbenzene vppb	m, p-Xylene vppb	o-Xylene vppb	Toluene vppb	Total Xylenes vppb	TPH-g vppm	TPH-g µg/L
C1-L199-VW1	8/28/2003	7	<1.47	<1.47	<1.47	<1.47	**2.6**	<0.35	<7.35	<32.487
	9/29/2003		<0.48	<0.35	<0.35	<0.35	**1.2**		<7.8	<27
	11/21/2003		<0.53	<0.39	<0.39	<0.39	**0.61**		<8.6	<30
	12/22/2003		<0.50	<0.65	<0.37	<0.37	<0.37		**8.2**	<29
C2-L3-VW1	8/28/2003	7	<1.86	<1.86	<1.86	<1.86	<1.86	<0.33	**53**	**190**
	9/29/2003		<0.48	<0.35	<0.33	<0.33	**1.9**		<7.3	<26
	11/21/2003		<0.47	<0.35	<0.35	<0.35	**0.61**		<8.6	<27
	12/22/2003		<0.49	<0.36	<0.36	<0.36	**1.2**		<8.1	<28
	12/22/2003		**0.59**	**0.42**	**1.1**	**0.39**	**9.3**		<6.6	<23
C3-L15-VW1	8/28/2003	8	<1.52	**0.63**	**1.2**	**0.58**	**5.2**	**1**	<7.6	<33.592
	9/29/2003		<0.46	**0.38**	**0.71**	**0.34**	**2.5**		<7.5	<26
	11/21/2003		<0.48	<0.35	**0.54**	<0.35	**1**		<7.8	<28
	12/22/2003		<0.50	**0.53**	**2.0**	**0.72**	**3.1**		<8.2	<29
C3-L15-VW1-Dup	8/28/2003	8	<1.47	<1.47	**0.63**	<1.47	**3.3**		<7.35	<32.487
	11/21/2003		<0.51	<0.38	**0.41**	<0.38	**1**		<8.3	<29
C4-L7-VW1	8/28/2003	8	<1.53	**0.71**	**1.2**	**0.88**	**5.2**	**0.79**	<7.65	<33.813
	9/29/2003		<0.47	<0.35	**0.44**	**0.39**	**1.5**		<7.7	<27
	11/21/2003		<0.52	<0.38	<0.38	<0.38	<0.44		<8.5	<30
	12/22/2003		<1.8	<1.4	<1.4	<1.4	<1.6		<7.5	<26
C5-L11-VW1	8/28/2003	7	<1.5	**0.77**	**1.1**	**0.55**	**4.6**	**1.2**	<7.5	<33.15
	9/29/2003		<0.46	**0.43**	**0.78**	**0.42**	**2.1**		<7.5	<26
	11/21/2003		<8.8	<6.5	<6.5	<6.5	<7.5		<7.2	<25
	12/22/2003		<9.6	<7.0	<7.0	<7.0	<8.1		<7.8	<28
C6-L29-VW1	8/28/2003	10	<1.53	<1.53	**0.73**	<1.53	**2.3**	**2.2**	<7.65	<33.813
	9/29/2003		<0.46	**0.61**	**2.2**	<0.34	**1.1**		<7.6	<27
	11/21/2003		<0.93	<0.68	<0.68	<0.68	<0.79		<7.6	<27
	12/22/2003		<11	<7.8	<7.8	<7.8	<9.0		<8.7	<31
C7-L16-VW2	8/28/2003	7	<1.52	<1.52	<1.52	<1.52	**2**	<0.35	<7.6	<33.592
	9/29/2003		<0.47	<0.35	<0.35	<0.35	**0.89**		<7.7	<27
C7-L16-VW1	11/21/2003		<0.50	<0.37	<0.37	<0.37	**0.59**		<8.2	<29
	12/22/2003		<5.1	<3.8	<3.8	<3.8	**7.3**		<8.3	<29

Table 4
Vapor Samples Collected from Permanent Vapor Monitoring Wells

Sample Number	Sample Date	Well Screen Depth (feet bgs)	TO-15 VOCs						8015 Gasoline	
			Benzene vppb	Ethylbenzene vppb	m, p-Xylene vppb	o-Xylene vppb	Toluene vppb	Total Xylenes vppb	TPH-g vppm	TPH-g µg/L
C8-L18-VW1	8/28/2003	8	<1.5	**0.44**	**1.3**	**0.71**	**1.7**	<0.34	<7.5	<33.15
	9/29/2003		<0.46	<0.34	<0.34	<0.34	**3.6**		<7.5	<26
	11/21/2003		<0.51	<0.38	<0.38	<0.38	<0.44		<8.4	<30
	12/22/2003		<0.47	<0.35	<0.35	<0.35	**0.81**		<7.7	<27
dup	9/29/2003		<0.46	<0.34	<0.34	<0.34	**0.76**	<0.34	<7.5	<26
C9-L5-VW1	8/28/2003	8	<1.53	<1.53	**0.41**	<1.53	**3**	**0.54**	<7.65	<33.813
	9/29/2003		<0.48	<0.35	**0.54**	<0.35	**1.3**		<7.8	<27
	11/21/2003		<0.49	<0.36	<0.36	<0.36	**0.58**		<8.0	<28
	12/22/2003		<0.55	<0.40	<0.40	<0.40	**1.1**		<8.9	<32
C10-L6-VW1	8/28/2003	7	<1.5	<1.5	**0.61**	<1.5	**2.3**	<0.35	<7.5	<33.15
	9/29/2003		<0.47	<0.35	<0.35	<0.35	**0.78**		<7.7	<27
	11/21/2003		<0.49	<0.36	<0.36	<0.36	**0.48**		<8.1	<28
	12/22/2003		**1.0**	**0.43**	**1.3**	**0.42**	**2.9**		<8.4	30
C11-L19-VW2-Shallow	8/28/2003	10	**15**	**9.3**	**12**	<1.46	**18**	**14**	**92**	**320**
	9/29/2003		**13**	**5.8**	**9.7**	**4.2**	**8.7**		**72**	**250**
	11/21/2003		**23**	**7**	**6.7**	<6.2	**10**		**100**	**370**
	12/22/2003		<3.7	<2.7	<2.7	<2.7	<3.1		**8.7**	**31**
C11-L19-VW2-Deep	8/28/2003	18	<1.49	**2.5**	**4.6**	**2.4**	**13**	**2.2**	**76**	**270**
	9/29/2003		<0.85	**0.63**	**1.4**	**0.83**	**1.7**		<6.9	<24
	11/21/2003		<0.98	<0.72	**1.1**	<0.72	**1**		<8.0	<28
	12/22/2003		<1.2	<0.86	<0.86	<0.86	**2**		<9.5	<33
C12-L3-VW1	8/28/2003	6.5	<1.57	<1.57	<1.57	<1.57	**1.9**	<0.4	<7.85	<34.697
	9/29/2003		<0.54	<0.40	<0.40	<0.40	**0.98**		<8.8	<31
	11/21/2003		<0.44	<0.33	<0.33	<0.33	<0.38		<7.3	<26
	12/22/2003		<0.48	<0.35	<0.35	<0.35	**0.41**		<7.9	<28
Data Sumary										
Minimum			0.59	0.38	0.41	0.34	0.41	0.54	8.2	30
Maximum			23	9.3	12	4.2	18	14	100	370
Depth of Max			10	10	10	10	10	10	10	10
Number of Samples			56	56	56	56	56	14	56	56
Number of Positive Detections			5	15	24	13	45	7	7	7
Frequency of Detection			9%	27%	43%	23%	80%	50%	13%	13%

bgs - below ground surface
µg/L - micrograms per liter
ppbv - parts per billion by volume
ppmv - parts per million by volume

Table 5
Groundwater Samples Collected from Cluster 12

Sample Number	Well Screen Depth (feet bgs)	Sample Date	8260 BTEX Only				8015 TPH-g Only
			Benzene µg/L	Ethylbenzene µg/L	Toluene µg/L	Xylenes, total µg/L	TPH-g µg/L
MW-1	5-20	8/27/2003	<10	20J	<50	36J	448
		9/30/2003	2	7.8	3.5J	13	237
		11/17/2003	6.8	17	6.3	20	439
		12/18/2003	9.1	17	4.6J	18	377
MW-2	5-20	8/27/2003	<1	<5	<5	<5	<50
MW-3	25-35	8/27/2003	<1	1.1J	<5	7.4	80
		9/30/2003	<1	<5	<5	1.3J	65
		11/17/2003	<1	<5	2.3J	4.4J	79
		12/18/2003	<1	11	8.3	42	138
MW-4	5-20	8/27/2003	<1	<5	<5	<5	149
		9/30/2003	<1	2.3J	2.5J	5.5	86
		11/17/2003	<1	2.1J	2.6J	5.3	131
		12/18/2003	1.9	15	10	30	351
MW-5	5-20	8/27/2003	<1	<5	<5	<5	62
		9/30/2003	<1	<5	<5	<5	64
		11/17/2003	<1	<5	<5	<5	73
		12/18/2003	<1	<5	<5	<5	<50
MW-10*	5-20	8/27/2003	<1	<5	<5	<5	146
		9/30/2003	<1	2.1J	2.3J	5	91
MW-4D**		11/17/2003	<1	2.6J	3.1J	6.9	120
MW-DUP***		12/18/2003	7.4	18	4.9J	20	400

* MW-10 is a duplicate sample from MW-4
** MW-4D is a duplicate sample from MW-4
*** MW-DUP is a duplicate sample from MW1
bgs - below ground surface
TPH-g - Total petroleum hydrocarbons as gasoline
µg/L - micrograms per liter
J - Approximate concentration below the laboratory detection limit

APPENDIX B

MODEL RESULTS FOR MIGRATION OF SOIL VAPOR TO INDOOR AIR

1. Johnson and Ettinger Model Input Parameter
2. Output Files for benzene, toluene, ethylbenzene and xylenes

Soil Vapor to Indoor Air
Johnson and Ettinger Vapor Model Input Parameters

Parameters (a)	Input Values	Reference
Soil vapor concentrations (ppmv)	Chemical-specific	Table 3-4
Henry's law constant (unitless)	Provided in Johnson & Ettinger VLOOKUP Tables	J&E 2003
Water diffusion coefficient (cm^2/s)		
Air diffusion coefficient (cm^2/s)		
Other chemical parameters: enthalpy of vaporization water solubility boiling point critical temperature		
Soil Parameters		
Average soil temperature (degrees C)	20	Default for California
Depth below grade to bottom of floor (cm)	15	J&E 1991 for residential
Soil gas sampling depth (cm)	304.8	site specific
SCS soil type (sand)	S	site specific
Thickness of soil stratum (cm)	304.8	site specific
Soil dry bulk density (g/cm^3)	1.61	site specific
Soil total porosity (unitless)	0.397	site specific
Soil water-filled porosity (unitless)	0.078	site specific
Building Parameters		
Height of structure (cm)	488	Two story house for residential
Length of sturcture (cm)	1000	J&E 2003 default
Width of structure (cm)	1000	J&E 2003 default
Floor thickness (cm)	15	J&E 1991 for residential
Floor-wall seam crack width (cm)	0.1	J&E 2003 default
Soil building pressure differential (g/cm^2-sec)	40	J&E 2003 default
Indoor air exchange rate (1/h)	0.66	Murray and Burmaster 1995

Note:
(a) parameters listed are chemical and site specific; values calculated by the model and model defaults are not listed

Acronyms/Abbreviations:
ASTM – American Society for Testing and Materials
C – Celsius
cm – centimeter
cm^2/s – square centimeters per second
cm^3/g – cubic centimeters per gram
g/cm^3 – grams per cubic centimeter
g/cm^2-s – grams per square centimeter per second
SCS – Soil Conservation Service
µg/kg – micrograms per kilogram
1/h – one exchange per hour

References:

J&E 1991. Heuristic Model for Predicting the Intrusion Rate of Contaminant Vapors into Building. Paul C. Johnson and Robert A. Ettinger. Environ. Sci. Technol. 1991, 25, 1445-1452.

J&E 2003. Software Implementation of Johnson and Ettinger Model. Version 3.0. February. United States Environmental Protection Agency.

Murray, D.M. and D.E. Burmaster. 1995. Residential Air Exchange Rate in the United States: Empirical and Estimated Parametric Distribution by Season and Climatic Region. Risk Analysis. Data presented in U.S. EPA Exposure Factors Handbook, Volume III, 1997.

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Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
71432			2.30E-02	Benzene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
15	304.8	20	304.8			s		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
	1.61	0.397	0.078								

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
15	40	1000	1000	488	0.1	0.66	5

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	30	30	350

END

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
9.46E+08	289.8	0.319	ERROR	ERROR	0.074	1.01E-07	0.933	9.42E-08	4,000	7.47E+01	8.95E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	8,019	4.39E-03	1.83E-01	1.78E-04	1.24E-02	0.00E+00	0.00E+00	1.24E-02	289.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	7.47E+01	0.10	8.33E+01	1.24E-02	4.00E+02	3.56E+109	3.16E-04	2.36E-02	7.8E-06	NA

END

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Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
100414			2.72E+00	Ethylbenzene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
15	304.8	20	304.8			s		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
	1.61	0.397	0.078								

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
15	40	1000	1000	488	0.1	0.66	5

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	30	30	350

END

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
9.46E+08	289.8	0.319	ERROR	ERROR	0.074	1.01E-07	0.933	9.42E-08	4,000	1.20E+04	8.95E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	10,040	5.89E-03	2.45E-01	1.78E-04	1.06E-02	0.00E+00	0.00E+00	1.06E-02	289.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.20E+04	0.10	8.33E+01	1.06E-02	4.00E+02	3.47E+128	2.83E-04	3.40E+00	1.1E-06	1.0E+00

END

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Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
108883			4.71E-01	Toluene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
15	304.8	20	304.8			s		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
	1.61	0.397	0.078								

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
15	40	1000	1000	488	0.1	0.66	5

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	30	30	350

END

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
9.46E+08	289.8	0.319	ERROR	ERROR	0.074	1.01E-07	0.933	9.42E-08	4,000	1.80E+03	8.95E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	9,045	5.10E-03	2.12E-01	1.78E-04	1.22E-02	0.00E+00	0.00E+00	1.22E-02	289.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.80E+03	0.10	8.33E+01	1.22E-02	4.00E+02	6.47E+110	3.13E-04	5.65E-01	NA	4.0E-01

END

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Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
106423			1.27E+01	p-Xylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
15	304.8	20	304.8			s		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
	1.61	0.397	0.078								

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
15	40	1000	1000	488	0.1	0.66	5

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	30	30	350

END

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
9.46E+08	289.8	0.319	ERROR	ERROR	0.074	1.01E-07	0.933	9.42E-08	4,000	5.60E+04	8.95E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	10,131	5.71E-03	2.37E-01	1.78E-04	1.08E-02	0.00E+00	0.00E+00	1.08E-02	289.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	5.60E+04	0.10	8.33E+01	1.08E-02	4.00E+02	2.32E+125	2.88E-04	1.61E+01	NA	7.0E+00

END

DATA SHEET

SG-ADV
Version 2.0; 02/03

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
95476			3.62E+00	o-Xylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
15	304.8	20	304.8			s		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
	1.61	0.397	0.078								

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
15	40	1000	1000	488	0.1	0.66	5

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	30	30	350

END

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
9.46E+08	289.8	0.319	ERROR	ERROR	0.074	1.01E-07	0.933	9.42E-08	4,000	1.60E+04	8.95E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	10,291	3.85E-03	1.60E-01	1.78E-04	1.22E-02	0.00E+00	0.00E+00	1.22E-02	289.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.60E+04	0.10	8.33E+01	1.22E-02	4.00E+02	6.47E+110	3.13E-04	5.01E+00	NA	7.0E+00

END

APPENDIX C

EQUATIONS USED TO CALCULATE THE RISK

1. California Preliminary Endangerment Assessment (PEA) Guidance: Exposure and Risk Equations
2. California Preliminary Endangerment Assessment (PEA) Guidance: Derivation of Equations

California Preliminary Endangement Assessment (PEA) Guidance Document
Exposure and Risk Equations

These equations from the California Preliminary Endangerment Assessment Guidance were used to calculate concentrations in outdoor air, noncancer hazard fo children and cancer risk for children and adult residents. These equations are presented in the PEA guidance in a reduced format that does not show all the exposure assumptions listed on Table 3-6 of the risk assessment. Expanded versions of these equations are included in the next portion of this Appendix.

Equation 1. Volatile Organic Chemical Concentrations in Outdoor Air

Ca = Ei / 99

where

Ca = ambient air concentration, milligrams per cubic meter (mg/m^3)

Ei = total emission reate for compound i, milligrams per second (mg/s), from Equation 2.

Equation 2. Total Emission Rate for Volatile Organic Chemicals

$$E_i = \frac{1.6x10^{5} \text{ x } D_i \text{ x } \frac{H_c}{K_d} \text{ x } C_i}{\sqrt{D_i \text{ x } \frac{0.023}{0.284 + 0.046x \frac{K_d}{H_c}}}}$$

where

Ei = average emission rate of compound i, over the residential lot during the exposure interval, mg/s

Di = diffusivity in air for compound i, square centimeters per second (cm^2/s)

Hc = Henry's Law constant, atmosphere-cubic meter per mole ($atm\text{-}m^3/mol$)

Kd = soil-water partition coefficient, cubic centimeters per gram (cm^3/g)

Ci = bulk soil concentration of contaminant i, as follows: chemical concentration in soil, milligrams per kilogram (mg/kg), x 10^{-6} kilograms per milligram (kg/mg)

Equation 3. Particulate Concentrations in Outdoor Air

Ca = Cs x ($5x10^{-8}$ kg/m^3)

where

Ca = ambient air concentration, milligrams per cubic meter (mg/m^3)

Cs = chemical concentration in soil, milligrams per kilogram (mg/kg)

Equation 4. Noncancer Hazard for Child Resident, Soil Exposure Pathway

Hazard (soil) = ((Cs/RfDo) x ($1.28x10^{-5}$)) + ((Cs/RfDo) x ($1.28x10^{-4}$) x ABS)

where

Cs = chemical concentration in soil, milligrams per kilogram (mg/kg)

RfDo = oral reference dose, mg/kg-day

ABS = absorption fraction, unitless

Equation 5. Noncancer Hazard for Child Resident, Air Exposure Pathway

Hazard (air) = (Ca/RfDi) x 0.639
where
Ca = ambient air concentration, milligrams per cubic meter (mg/m^3)
RfDi = inhalation reference dose, mg/kg-day

Equation 6. Cancer Risk for Resident, Soil Exposure Pathway

Risk (soil) = ((Cs x SFo) x (1.57×10^{-6})) + ((Cs x SFo) x (1.87×10^{-5}) x ABS)
where
Cs = chemical concentration in soil, milligrams per kilogram (mg/kg)
SFo = oral cancer slope factor, $(mg/kg\text{-}day)^{-1}$
ABS = absorption fraction, unitless

Equation 7. Cancer Risk for Resident, Air Exposure Pathway

Risk (air) = (Ca x SFi) x 0.149
where
Ca = ambient air concentration, milligrams per cubic meter (mg/m^3)
SFi = inhalation cancer slope factor, $(mg/kg\text{-}day)^{-1}$

California Preliminary Endangement Assessment (PEA) Guidance Document
Derivation of Risk Equations

This section presents the expanded PEA equations used to calculate the risks so that each of the exposure assumptions shown in Table 3-6 of the risk assessment can be seen. The reduce version of the equations is presented on to the previous table in this Appendix.

Noncancer Hazard for Child Resident, Soil Exposure Pathway

Original Equation:

Hazard (soil) = (1/RfDo) x (Cs x IRs x EF x ED x 10-6 kg/mg)/(BW x AT)
+ (1/RfDo) x (CS x SA x AF x ABS x EF x ED x 10-6 kg/mg)/(BW x AT)

where

Cs = chemical concentration in soil, mg/kg, chemical specific
RfDo = oral reference dose, mg/kg-day, chemical specific
IRs = incidental soil ingestion rate, 200 mg/day
EF = exposure frequency, 350 days/year
ED = exposure duration, 6 years
BW = body weight, 15 kg
AT = averaging time, 2190 days
SA = skin surface area exposed, 2000 cm^2
AF = soil to skin adherence factor, 1 mg/cm^2
ABS = absorption fraction of chemical from soil, chemical specific

Reduced Equation:

Hazard (soil) = ((Cs/RfDo) x ($1.28x10^{-5}$)) + ((Cs/RfDo) x ($1.28x10^{-4}$) x ABS)

where

Cs = chemical concentration in soil, mg/kg, chemical specific
RfDo = oral reference dose, mg/kg-day, chemical specific
ABS = absorption fraction, dimensionless (0.10)

Noncancer Hazard for Child Resident, Air Exposure Pathway

Original Equation:

Hazard (air) = (1/RfDi) x (Ca x IR x EF x ED)/(BW x AT)

where

Ca = ambient air concentration, mg/m^3, chemical specific
RfDi = inhalation reference dose, mg/kg-day, chemical specific
IR = inhalation rate, 10 m^3/day
EF = exposure frequency, 350 days/year
ED = exposure duration, 6 years
BW = body weight, 15 kg
AT = averaging time, 2190 days

Reduced Equation:

Hazard (air) = (Ca/RfDi) x 0.639

where

Ca = ambient air concentration, mg/m^3, chemical specific
RfDi = inhalation reference dose, mg/kg-day, chemical specific

California Preliminary Endangement Assessment (PEA) Guidance Document
Derivation of Risk Equations

Cancer Risk for Resident, Soil Exposure Pathway

Original Equation:

Risk (soil) = SFo x (Cs x IRs,adult x EF x EDadult x 10-6 kg/mg)/(BWadult x AT)
+ SFo x (Cs x IRs,child x EF x EDchild x 10-6 kg/mg)/(BWchild x AT)
+ SFo x (CS x SAadult x AF x ABS x EFadult x EDadult x 10-6 kg/mg)/(BWadult x AT)
+ SFo x (CS x SAchild x AF x ABS x EFchild x EDchild x 10-6 kg/mg)/(BWchild x AT)

where

SFo = oral cancer slope factor, $(mg/kg\text{-}day)^{-1}$, chemical specific
Cs = chemical concentration in soil, mg/kg, chemical specific
IR = incidental soil ingestion rate, 200 mg/day for children and 100 mg/day for adults
EF = exposure frequency for soil ingestion, 350 days/year
exposure frequency for dermal contact, 350 days/year for children and 100 days/year for adults
ED = exposure duration, 6 years for children and 24 years for adults
BW = body weight, 15 kg for children and 70 kg for adults
AT = averaging time, 25550 days
SA = skin surface area exposed, 2000 cm^2 for chilren and 5800 cm^2 for adults
AF = soil to skin adherence factor, 1 mg/cm^2
ABS = absorption fraction of chemical from soil, chemical specific

Reduced Equation:

Risk (soil) = ((Cs x SFo) x (1.57×10^{-6})) + ((Cs x SFo) x (1.87×10^{-5}) x ABS)

where

Cs = chemical concentration in soil, mg/kg, chemical specific
SFo = oral cancer slope factor, $(mg/kg\text{-}day)^{-1}$, chemical specific
ABS = absorption fraction of chemical from soil, chemical specific

Cancer Risk for Resident, Air Exposure Pathway

Original Equation:

Risk (air) = SFi x (Ca x IRadult x EF x EDadult)/(BWadult x AT)
+ SFi x (Ca x IRchild x EF x EDchild)/(BWchild x AT)

SFi = inhalation cancer slope factor, $(mg/kg\text{-}day)^{-1}$, chemical specific
Ca = ambient air concentration, milligrams per cubic meter (mg/m^3)
IR = inhalation rate, 10 m^3/day for children and 20 m^3/day for adults
EF = exposure frequency, 350 days/year
ED = exposure duration, 6 years for children and 24 years for adults
BW = body weight, 15 kg for children and 70 kg for adults
AT = averaging time, 25550 days

Reduced Equation:

Risk (air) = (Ca x SFi) x 0.149

where

Ca = ambient air concentration, milligrams per cubic meter (mg/m^3)
SFi = inhalation cancer slope factor, $(mg/kg\text{-}day)^{-1}$, chemical specific

APPENDIX D

TOXICOLOGICAL PROFILES OF CHEMICALS

1. Toxicological Profiles for benzene, toluene, ethylbenzene and xylenes

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

BENZENE
CAS # 71-43-2

Agency for Toxic Substances and Disease Registry ToxFAQs September 1997

This fact sheet answers the most frequently asked health questions (FAQs) about benzene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Benzene is a widely used chemical formed from both natural processes and human activities. Breathing benzene can cause drowsiness, dizziness, and unconsciousness; long-term benzene exposure causes effects on the bone marrow and can cause anemia and leukemia. Benzene has been found in at least 813 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is benzene?

(Pronounced bĕn′zēn′)

Benzene is a colorless liquid with a sweet odor. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is formed from both natural processes and human activities.

Benzene is widely used in the United States; it ranks in the top 20 chemicals for production volume. Some industries use benzene to make other chemicals which are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Natural sources of benzene include volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke.

What happens to benzene when it enters the environment?

- Industrial processes are the main source of benzene in the environment.
- Benzene can pass into the air from water and soil.
- It reacts with other chemicals in the air and breaks down within a few days.
- Benzene in the air can attach to rain or snow and be carried back down to the ground.
- It breaks down more slowly in water and soil, and can pass through the soil into underground water.
- Benzene does not build up in plants or animals.

How might I be exposed to benzene?

- Outdoor air contains low levels of benzene from tobacco smoke, automobile service stations, exhaust from motor vehicles, and industrial emissions.
- Indoor air generally contains higher levels of benzene from products that contain it such as glues, paints, furniture wax, and detergents.
- Air around hazardous waste sites or gas stations will contain higher levels of benzene.
- Leakage from underground storage tanks or from hazardous waste sites containing benzene can result in benzene contamination of well water.
- People working in industries that make or use benzene may be exposed to the highest levels of it.
- A major source of benzene exposures is tobacco smoke.

How can benzene affect my health?

Breathing very high levels of benzene can result in death, while high levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, rapid heart rate, and death.

The major effect of benzene from long-term (365 days or longer) exposure is on the blood. Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection.

Some women who breathed high levels of benzene for many months had irregular menstrual periods and a decrease in the size of their ovaries. It is not known whether benzene exposure affects the developing fetus in pregnant women or fertility in men.

Animal studies have shown low birth weights, delayed bone formation, and bone marrow damage when pregnant animals breathed benzene.

How likely is benzene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that benzene is a known human carcinogen. Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood-forming organs.

Is there a medical test to show whether I've been exposed to benzene?

Several tests can show if you have been exposed to benzene. There is test for measuring benzene in the breath; this test must be done shortly after exposure. Benzene can also be measured in the blood, however, since benzene disappears rapidly from the blood, measurements are accurate only for recent exposures.

In the body, benzene is converted to products called metabolites. Certain metabolites can be measured in the urine. However, this test must be done shortly after exposure and is not a reliable indicator of how much benzene you have been exposed to, since the metabolites may be present in urine from other sources.

Has the federal government made recommendations to protect human health?

The EPA has set the maximum permissible level of benzene in drinking water at 0.005 milligrams per liter (0.005 mgL). The EPA requires that spills or accidental releases into the environment of 10 pounds or more of benzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit of 1 part of benzene per million parts of air (1 ppm) in the workplace during an 8-hour workday, 40-hour workweek.

Glossary

Anemia: A decreased ability of the blood to transport oxygen.

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Chromosomes: Parts of the cells responsible for the development of hereditary characteristics.

Metabolites: Breakdown products of chemicals.

Milligram (mg): One thousandth of a gram.

Pesticide: A substance that kills pests.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Benzene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ETHYLBENZENE

CAS # 100-41-4

Agency for Toxic Substances and Disease Registry ToxFAQs June 1999

This fact sheet answers the most frequently asked health questions (FAQs) about ethylbenzene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Ethylbenzene is a colorless liquid found in a number of products including gasoline and paints. Breathing very high levels can cause dizziness and throat and eye irritation. Ethylbenzene has been found in at least 731 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is ethylbenzene?

(Pronounced ĕth′ əl bĕn′ zēn′)

Ethylbenzene is a colorless, flammable liquid that smells like gasoline. It is found in natural products such as coal tar and petroleum and is also found in manufactured products such as inks, insecticides, and paints.

Ethylbenzene is used primarily to make another chemical, styrene. Other uses include as a solvent, in fuels, and to make other chemicals.

What happens to ethylbenzene when it enters the environment?

- Ethylbenzene moves easily into the air from water and soil.
- It takes about 3 days for ethylbenzene to be broken down in air into other chemicals.
- Ethylbenzene may be released to water from industrial discharges or leaking underground storage tanks.
- In surface water, ethylbenzene breaks down by reacting with other chemicals found naturally in water.
- In soil, it is broken down by soil bacteria.

How might I be exposed to ethylbenzene?

- Breathing air containing ethylbenzene, particularly in areas near factories or highways.
- Drinking contaminated tap water.
- Working in an industry where ethylbenzene is used or made.
- Using products containing it, such as gasoline, carpet glues, varnishes, and paints.

How can ethylbenzene affect my health?

Limited information is available on the effects of ethylbenzene on people's health. The available information shows dizziness, throat and eye irritation, tightening of the chest, and a burning sensation in the eyes of people exposed to high levels of ethylbenzene in air.

Animals studies have shown effects on the nervous system, liver, kidneys, and eyes from breathing ethylbenzene in air.

How likely is ethylbenzene to cause cancer?

The EPA has determined that ethylbenzene is not classifiable as to human carcinogenicity.

No studies in people have shown that ethylbenzene exposure can result in cancer. Two available animal studies suggest that ethylbenzene may cause tumors.

How can ethylbenzene affect children?

Children may be exposed to ethylbenzene through inhalation of consumer products, including gasoline, paints, inks, pesticides, and carpet glue. We do not know whether children are more sensitive to the effects of ethylbenzene than adults.

It is not known whether ethylbenzene can affect the development of the human fetus. Animal studies have shown that when pregnant animals were exposed to ethylbenzene in air, their babies had an increased number of birth defects.

How can families reduce the risk of exposure to ethylbenzene?

Exposure to ethylbenzene vapors from household products and newly installed carpeting can be minimized by using adequate ventilation.

Household chemicals should be stored out of reach of children to prevent accidental poisoning. Always store household chemicals in their original containers; never store them in containers children would find attractive to eat or drink from, such as old soda bottles. Gasoline should be stored in a gasoline can with a locked cap.

Sometimes older children sniff household chemicals, including ethylbenzene, in an attempt to get high. Talk with your children about the dangers of sniffing chemicals.

Is there a medical test to show whether I've been exposed to ethylbenzene?

Ethylbenzene is found in the blood, urine, breath, and some body tissues of exposed people. The most common way to test for ethylbenzene is in the urine. This test measures substances formed by the breakdown of ethylbenzene. This test needs to be done within a few hours after exposure occurs, because the substances leave the body very quickly.

These tests can show you were exposed to ethylbenzene, but cannot predict the kind of health effects that might occur.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level of 0.7 milligrams of ethylbenzene per liter of drinking water (0.7 mg/L).

The EPA requires that spills or accidental releases into the environment of 1,000 pounds or more of ethylbenzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set an occupational exposure limit of 100 parts of ethylbenzene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for ethylbenzene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TOLUENE
CAS # 108-88-3

Division of Toxicology ToxFAQs™ February 2001

This fact sheet answers the most frequently asked health questions (FAQs) about toluene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to toluene occurs from breathing contaminated workplace air, in automobile exhaust, some consumer products paints, paint thinners, fingernail polish, lacquers, and adhesives. Toluene affects the nervous system. Toluene has been found at 959 of the 1,591 National Priority List sites identified by the Environmental Protection Agency

What is toluene?

Toluene is a clear, colorless liquid with a distinctive smell. Toluene occurs naturally in crude oil and in the tolu tree. It is also produced in the process of making gasoline and other fuels from crude oil and making coke from coal.

Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives, and rubber and in some printing and leather tanning processes.

What happens to toluene when it enters the environment?

❑ Toluene enters the environment when you use materials that contain it. It can also enter surface water and groundwater from spills of solvents and petrolieum products as well as from leasking underground storage tanks at gasoline stations and other facilities.

❑ When toluene-containing products are placed in landfills or waste disposal sites, the toluene can enter the soil or water near the waste site.

❑ Toluene does not usually stay in the environment long.

❑ Toluene does not concentrate or buildup to high levels in animals.

How might I be exposed to toluene?

❑ Breathing contaminated workplace air or automobile exhaust.

❑ Working with gasoline, kerosene, heating oil, paints, and lacquers.

❑ Drinking contaminated well-water.

❑ Living near uncontrolled hazardous waste sites containing toluene products.

How can toluene affect my health?

Toluene may affect the nervous system. Low to moderate levles can cause tiredness, confusion, weakness, drunken-type actions, memory loss, nausea, loss of appetite, and

hearing and color vision loss. These symptoms usually disappear when exposure is stopped.

Inhaling High levels of toluene in a short time can make you feel light-headed, dizzy, or sleepy. It can also cause unconsciousness, and even death.

High levels of toluene may affect your kidneys.

How likely is toluene to cause cancer?

Studies in humans and animals generally indicate that toluene does not cause cancer.

The EPA has determined that the carcinogenicity of toluene can not be classified.

How can toluene affect children?

It is likely that health effects seen in children exposed to toluene will be similar to the effects seen in adults. Some studies in animals suggest that babies may be more sensitive than adults.

Breathing very high levels of toluene during pregnancy can result in children with birth defects and retard mental abilities, and growth. We do not know if toluene harms the unborn child if the mother is exposed to low levels of toluene during pregnancy.

How can families reduce the risk of exposure to toluene?

❑ Use toluene-containing products in well-ventilated areas.

❑ When not in use, toluene-containing products should be tightly covered to prevent evaporation into the air.

Is there a medical test to show whether I've been exposed to toluene?

There are tests to measure the level of toluene or its breakdown products in exhaled air, urine, and blood. To determine if you have been exposed to toluene, your urine or blood must be checked within 12 hours of exposure. Several other chemicals are also changed into the same breakdown products as toluene, so some of these tests are not specific for toluene.

Has the federal government made recommendations to protect human health?

EPA has set a limit of 1 milligram per liter of drinking water (1 mg/L).

Discharges, releases, or spills of more than 1,000 pounds of toluene must be reported to the National Response Center.

The Occupational Safety and Health Administration has set a limit of 200 parts toluene per million of workplace air (200 ppm).

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological Profile for Toluene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

XYLENE
CAS # 1330-20-7

Agency for Toxic Substances and Disease Registry ToxFAQs September 1996

This fact sheet answers the most frequently asked health questions (FAQs) about xylene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to xylene occurs in the workplace and when you use paint, gasoline, paint thinners and other products that contain it. People who breathe high levels may have dizziness, confusion, and a change in their sense of balance. This substance has been found in at least 658 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is xylene?

(Pronounced zī/lēn)

Xylene is a colorless, sweet-smelling liquid that catches on fire easily. It occurs naturally in petroleum and coal tar and is formed during forest fires. You can smell xylene in air at 0.08–3.7 parts of xylene per million parts of air (ppm) and begin to taste it in water at 0.53–1.8 ppm.

Chemical industries produce xylene from petroleum. It's one of the top 30 chemicals produced in the United States in terms of volume.

Xylene is used as a solvent and in the printing, rubber, and leather industries. It is also used as a cleaning agent, a thinner for paint, and in paints and varnishes. It is found in small amounts in airplane fuel and gasoline.

What happens to xylene when it enters the environment?

- ❑ Xylene has been found in waste sites and landfills when discarded as used solvent, or in varnish, paint, or paint thinners.
- ❑ It evaporates quickly from the soil and surface water into the air.
- ❑ In the air, it is broken down by sunlight into other less harmful chemicals.
- ❑ It is broken down by microorganisms in soil and water.
- ❑ Only a small amount of it builds up in fish, shellfish, plants, and animals living in xylene-contaminated water.

How might I be exposed to xylene?

- ❑ Breathing xylene in workplace air or in automobile exhaust.
- ❑ Breathing contaminated air.
- ❑ Touching gasoline, paint, paint removers, varnish, shellac, and rust preventatives that contain it.
- ❑ Breathing cigarette smoke that has small amounts of xylene in it.
- ❑ Drinking contaminated water or breathing air near waste sites and landfills that contain xylene.
- ❑ The amount of xylene in food is likely to be low.

How can xylene affect my health?

Xylene affects the brain. High levels from exposure for short periods (14 days or less) or long periods (more than 1 year) can cause headaches, lack of muscle coordination, dizziness, confusion, and changes in one's sense of balance. Exposure of

people to high levels of xylene for short periods can also cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; problems with the lungs; delayed reaction time; memory difficulties; stomach discomfort; and possibly changes in the liver and kidneys. It can cause unconsciousness and even death at very high levels.

Studies of unborn animals indicate that high concentrations of xylene may cause increased numbers of deaths, and delayed growth and development. In many instances, these same concentrations also cause damage to the mothers. We do not know if xylene harms the unborn child if the mother is exposed to low levels of xylene during pregnancy.

How likely is xylene to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that xylene is not classifiable as to its carcinogenicity in humans.

Human and animal studies have not shown xylene to be carcinogenic, but these studies are not conclusive and do not provide enough information to conclude that xylene does not cause cancer.

Is there a medical test to show whether I've been exposed to xylene?

Laboratory tests can detect xylene or its breakdown products in exhaled air, blood, or urine. There is a high degree of agreement between the levels of exposure to xylene and the levels of xylene breakdown products in the urine. However, a urine sample must be provided very soon after exposure ends because xylene quickly leaves the body. These tests are not routinely available at your doctor's office.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 10 ppm of xylene in drinking water.

The EPA requires that spills or accidental releases of xylenes into the environment of 1,000 pounds or more must be reported.

The Occupational Safety and Health Administration (OSHA) has set a maximum level of 100 ppm xylene in workplace air for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH) also recommend exposure limits of 100 ppm in workplace air.

NIOSH has recommended that 900 ppm of xylene be considered immediately dangerous to life or health. This is the exposure level of a chemical that is likely to cause permanent health problems or death.

Glossary

Evaporate: To change from a liquid into a vapor or a gas.

Carcinogenic: Having the ability to cause cancer.

CAS: Chemical Abstracts Service.

ppm: Parts per million.

Solvent: A liquid that can dissolve other substances.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for xylenes (update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

APPENDIX F

CALIFORNIA DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES WELL ABANDONMENT STANDARDS FOR OIL AND GAS WELLS

FROM California Code of Regulations (CCR), Title 14, Chapter 4, Section 1723

online at: http://www.consrv.ca.gov/DOG/pubs_stats/law_regulations.htm

1723. Plugging and Abandonment-General Requirements.
(a) Cement Plugs. In general, cement plugs will be placed across specified intervals to protect oil and gas zones, to prevent degradation of usable waters, to protect surface conditions, and for public health and safety purposes. At the discretion of the district deputy, cement may be mixed with or replaced by other substances with adequate physical properties.
(b) Hole Fluid. Mud fluid having the proper weight and consistency to prevent movement of other fluids into the well bore shall be placed across all intervals not plugged with cement, and shall be surface poured into all open annuli.
(c) Plugging by Bailer. Placing of a cement plug by bailer shall not be permitted at a depth greater than 3,000 feet. Water is the only permissible hole fluid in which a cement plug shall be placed by bailer.
(d) Surface Pours. A surface cement-pour shall be permitted in an empty hole with a diameter of not less than 5 inches. Depth limitations shall be determined on an individual well basis by the district deputy.
(e) Blowout Prevention Equipment. Blowout prevention equipment may be required during plugging and abandonment operations. Any blowout prevention equipment and inspection requirements determined necessary by the district deputy shall appear on the approval to plug and abandon issued by the division.
(f) Junk in Hole. Diligent effort shall be made to recover junk when such junk may prevent proper plugging and abandonment either in open hole or inside casing. In the event that junk cannot be removed from the hole and fresh-saltwater contacts or oil or gas zones penetrated below cannot therefore be properly abandoned, cement shall be downsqueezed through or past the junk and a 100-foot cement plug shall be placed on top of the junk. If it is not possible to downsqueeze through the junk, a 100-foot cement plug shall be placed on top of the junk.

NOTE: Authority cited: Sections 3013 and 3106, Public Resources Code. Reference: Sections 3219 and 3228, Public Resources Code.

1723.1. Plugging of Oil or Gas Zones.
(a) Plugging in an Open Hole. A cement plug shall be placed to extend from the total depth of the well or from at least 100 feet below the bottom of each oil or gas zone, to at least 100 feet above the top of each oil or gas zone.
(b) Plugging in a Cased Hole. All perforations shall be plugged with cement, and the plug shall extend at least 100 feet above the top of a landed liner, the uppermost perforations, the casing cementing point, the water shut-off holes, or the oil or gas zone, whichever is highest.
(c) Special Requirements. Special requirements may be made for particular types of hydrocarbon zones, such as:
(1) Fractured shale or schist;
(2) Massive sand intervals, particularly those with good vertical permeability; or
(3) Any depleted productive interval more than 100 feet thick.

As a minimum for an open-hole plugging and abandonment, the special requirement shall consist of a cement plug extending from at least 100 feet below the top of the oil or gas zone to at least 100 feet above the top of the zone.

As a minimum for a cased-hole plugging and abandonment, the special requirement shall consist of a cement plug extending from at least 100 feet below the top of the zone to at least 100 feet above the top of the perforations, the top of the landed liner, the casing cementing point, the water shutoff holes, or the zone, whichever is highest.
(d) Bridge Plug. A bridge plug above the lowermost zone in a multiple-zone completion may be allowed in lieu of cement through that zone if the zone is isolated from the upper zones by cement behind the casing.

NOTE: Authority cited: Sections 3013 and 3106, Public Resources Code. Reference: Section 3228, Public Resources Code.

1723.2. Plugging for Freshwater Protection.
(a) Plugging in Open Hole.
(1) A minimum 200-foot cement plug shall be placed across all fresh-saltwater interfaces.
(2) An interface plug may be placed wholly within a thick shale if such shale separates the freshwater sands from the brackish or saltwater sands.
(b) Plugging in a Cased Hole.
(1) If there is cement behind the casing across the fresh-saltwater interface, a 100-foot cement plug shall be placed inside the casing across the interface.
(2) If the top of the cement behind the casing is below the top of the highest saltwater sands, squeeze-cementing shall be required through perforations to protect the freshwater deposits. In addition, a 100-foot cement plug shall be placed inside the casing across the fresh-saltwater interface.
(3) Notwithstanding other provisions of this section, the district deputy may require or allow a cavity shot immediately below the base of the freshwater sands. In such cases, the hole shall be cleaned out to the estimated bottom of the cavity and a 100-foot cement plug shall be placed in the casing from the cleanout point.
(c) Special Plugging Requirements. Where geologic or groundwater conditions dictate, special plugging procedures may be specified to prevent contamination of useable waters by downward percolation of poor quality surface waters, separate water zones of varying quality, and isolate dry sands that are in hydraulic continuity with groundwater aquifers.

NOTE: Authority cited: Section 3013, Public Resources Code. Reference: Sections 3106 and 3228, Public Resources Code.

1723.3. Plugging at a Casing Shoe.
If the hole is open below a shoe, a cement plug shall extend from at least 50 feet below to at least 50 feet above the shoe. If the hole cannot be cleaned out to 50 feet below the shoe, a 100-foot cement plug shall be placed as deep as possible.

NOTE: Authority cited: Sections 3013 and 3106, Public Resources Code. Reference: Sections 3106 and 3228, Public Resources Code.

1723.4. Plugging at the Casing Stub.

When casing is recovered from inside another casing string (or strings), and the outer string (or strings) is cemented opposite the casing stub, a 100-foot cement plug shall be required on the casing stub. A plug on the casing stub will generally not be required when casing is recovered in open hole or from inside another casing string that is not cemented opposite the casing stub.

NOTE: Authority cited: Sections 3013 and 3106, Public Resources Code. Reference: Sections 3106 and 3228, Public Resources Code.

1723.5. Surface Plugging.

The hole and all annuli shall be plugged at the surface with at least a 25-foot cement plug. The district deputy may require that inner strings of uncemented casing be removed to at least the base of the surface plug prior to placement of the plug.

All well casing shall be cut off at least 5 feet below the surface of the ground. In urban areas, as defined in Section 1760(j), a steel plate at least as thick as the outer well casing shall be welded around the circumference of the outer casing at the top of the casing, after division approval of the surface plug.

NOTE: Authority cited: Sections 3013 and 3106, Public Resources Code. Reference: Section 3106, Public Resources Code.

1723.6. Recovery of Casing.

(a) Approval to recover all casing possible will be given in the plugging and abandonment of wells where subsurface plugging can be done to the satisfaction of the district deputy.

(b) The hole shall be full of fluid prior to the detonation of any explosives in the hole. Such explosives shall be utilized only by a licensed handler with the required permits.

NOTE: Authority cited: Sections 3013 and 3106, Public Resources Code. Reference: Sections 3106 and 3228, Public Resources Code.

1723.7. Inspection of Plugging and Abandonment Operations.

Plugging and abandonment operations that require witnessing by the division shall be witnessed and approved by a division employee. When discretion is indicated by these regulations, the district deputy shall determine which operations are to be witnessed.

(a) Blowout prevention equipment-may inspect and witness testing of equipment and installation.

(b) Oil and gas zone plug-may witness placing and shall witness location and hardness.

(c) Mudding of hole-may witness mudding operations and determine that specified physical characteristics of mud fluid are met.

(d) Freshwater protection:

(1) Plug in open hole-may witness placing and shall witness location and hardness. Plug in cased hole-shall witness placing or location and hardness.

(2) Cementing through perforations-shall witness cementing operation.

(3) Cavity shot-may witness shooting and shall witness placing or location and hardness of required plug.

(e) Casing shoe plug-shall witness placing or location and hardness.

(f) Casing stub plug-shall witness placing or location and hardness.

(g) Surface plug-may witness emplacement and shall witness or verify location.

(h) Environmental inspection (after completion of plugging operations)-shall determine that division environmental regulations (California Code of Regulations, Title 14, Subchapter 2) have been adhered to.

NOTE: Authority cited: Sections 3013 and 3106, Public Resources Code. Reference: Section 3228, Public Resources Code.

1723.8. Special Requirements.
The supervisor, in special cases, may set forth other plugging and abandonment requirements or may establish field rules for the plugging and abandonment of wells. Such cases include, but are not limited to:
(a) The plugging of a high-pressure saltwater zone.
(b) Perforating and squeeze-cementing previously uncemented casing within and above a hydrocarbon zone.

NOTE: Authority cited: Sections 3013 and 3106, Public Resources Code. Reference: Section 3106, Public Resources Code.

1723.9 Testing of Idle Wells.
Any well that has not produced oil or natural gas or been used for fluid injection for a continuous six-month period during any consecutive five-year period, prior to or after the adoption of this regulation, must have either the fluid level determined using acoustical, mechanical, or other reliable methods, or other diagnostic tests as approved by the supervisor. Additional well tests or remedial operations may be required if the fluid level is located above or adjacent to freshwater or potential drinking water zones, or as specified by the appropriate division district deputy. Subsequent testing periods shall be based on the fluid level in the well, the well's location in relation to freshwater zones, mitigation measures taken by the operator to prevent fluid migration, or other factors determined by the appropriate division district deputy, upon a showing of good cause. The appropriate district office shall be notified before tests are made, as a Division inspector may witness the operations.

NOTE: Authority cited: Section 3013, Public Resources Code. Reference: Section 3106, Public Resources Code.