



Signal Hill Petroleum Conditional Use Permit 97-03 Extension Draft Environmental Impact Report

State Clearinghouse #2023010217



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Acronyms and Abbreviations

AB	Assembly Bill	CESA	California Endangered Species Act
AER	Annual emissions reporting	CH ₄	methane
AF	Acre-feet	CHRIS	California Historic Resources Information System
AFY	Acre-feet per year	CNDDB	California natural diversity database
BACT	Best available control technology	CNEL	Community noise equivalent level
Bgs	Below ground surface	CNPS	California Native Plant Survey
BLM	U.S. Bureau of Land Management	CO	Carbon monoxide
BMP	Best management practice	CO ₂	Carbon dioxide
BTU	British Thermal Units	CUP	Conditional use permit
CAAQS	California ambient air quality standards	CUPA	Certified unified program agency
CARB	California Air Resources Board	CWA	Clean Water Act
CalEPA	California Environmental Protection Agency	dba	A-weighted decibels
CalGEM	California Geologic Energy Management Division	dB	decibels
CAL FIRE	California Department of Fire and Forestry	DOT	Department of transportation
CAPCOA	California Air Pollution Control Officers Association	DPM	Diesel particulate matter
CCR	California Code of Regulations	DTSC	Department of Toxic Substances Control
CDFW	California Department of Fish and Wildlife	°F	Degrees Fahrenheit
CDOC	California Department of Conservation	EIR	Environmental impact report
CEC	California Energy Commission	ESA	Endangered Species Act
CEPP		FAA	Federal aviation administration
CEQA	California Environmental Quality Act	FHWA	Federal Highway Administration
CEMS	Community Emissions Monitoring System	FTA	Federal Transportation Administration
CERS	California Environmental Reporting System	GHGG	Greenhouse gas
		GHGRP	Greenhouse gas reporting program
		GWP	Global warming potential

GWh	Gigawatt hours	MW	megawatt
HAPs	Hazardous air pollutants	MWh	Megawatt hours
HFC		NAAQS	National ambient air quality standards
HI	Hazard index		
HMBP	Hazardous materials business plan	NAHC	Native American Heritage Commission
Hp	horsepower	NF ₃	Nitrogen trifluoride
HRA	Health risk assessment	NHPA	National Historic Preservation Act
HSC	Health and Safety Code	NO ₂	Nitrogen dioxide
Kwh	Kilowatt hours	NO _x	Nitrogen oxides
LCFS	Low carbon fuel standard	N ₂ O	Nitrous oxide
LDAR	Leak detection and repair	NONA	Notice of non-applicability
L _{dn}	Day Night Sound Level	NOP	Notice of preparation
Leq	Average sound level	NRHP	National Register of Historic Places
Lmax	Maximum sound level		
LOS	Level of service	O ₃	ozone
LST	Localized significance thresholds	OEHHA	Office of Environmental Health Hazards Administration
LTS	Low temperature separation		
MATES	Multiple air toxics exposure stud	Pb	lead
MBTA	Migratory Bird Treaty Act	PFC	perfluorocarbons
MCF	Million cubic feet	PHMSA	Pipeline Hazardous Materials Safety Administration
MCL	Maximum contaminant level	PID	Photoionization detector
MEIR	Maximum exposed individual resident	PM	Particulate matter
MEIW	Maximum exposed individual worker	PM _{2.5}	Particulate matter less than 2.5 microns
MICR	Maximum individual cancer risk	PM ₁₀	Particulate matter less than 10 microns
MMRP	Mitigation monitoring and reporting program	PPV	Peak particle volume
MMT	Million metric tons	PRC	Public Resources Code
MND	Mitigated negative declaration	PSD	Prevention of significant deterioration
MS4	Municipal separate stormwater system	SB	Senate bill
		SCAB	South Coast Air Basin
		SCAQMD	South Coast Air Quality Management District
MTCO _{2e}	Metric tons carbon dioxide equivalent	SHP	Signal Hill Petroleum

SIP	State Implementation Plan
SO ₂	Sulfur dioxide
SO _x	Sulfur oxides
SPCC	Spill prevention containment and countermeasures
SSC	Species of special concern
SWPPP	Stormwater pollution prevention program
SWRCB	State Water Resources Control Board
TAC	Toxic air contaminants
TDS	Total dissolved solids
UIC	Underground injection control
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VMT	Vehicle miles traveled
VOC	Volatile organic compounds
VRM	Visual resources manual
WDR	Waste discharge requirements
WRD	Water replenishment district

Executive Summary

Introduction

Seven oil and gas development drill sites are present in the City of Signal Hill (City). A drill site is a designated area within which multiple oil and gas wells and/or fluid storage and handling facilities may be located. The drill sites were originally owned by ARCO, Shell, and Texaco and each site was operated under a separate Conditional Use Permit (CUP). Signal Hill Petroleum began acquiring the drill sites in 1984, and once they acquired all seven drill sites in 1998, the City consolidated the CUP to cover all sites under one permit, CUP 97-03. Once the drill sites were established, no new oil and gas wells were allowed anywhere in the City except within a drill site, with the intent to consolidate oil and gas operations into specified locations and allow the redevelopment of other areas of the City outside of the drill sites. However, those active oil and gas wells already present in the City prior to the development of the drill sites are able to continue to operate. Although the municipal code allows for the creation of new drill sites in commercial and industrial zoning districts, the City's intent has been maintained and no new drill sites have been established since the original seven were established. The City is now considering Signal Hill Petroleum's (SHP) request for a 20-year extension of CUP 97-03 for the seven drill sites (Project). During the 20-year extended CUP period, SHP proposes to install new equipment at the existing natural gas processing facility at Drill Site #2 and drill up to 46 new wells which may be located within any of the seven drill sites. All other operational activities, such as site maintenance, inspections, redrilling, well operations, and fluid processing would remain the same during the 20-year extension of the CUP.

Project Location

The Project is located entirely within the boundaries of the City of Signal Hill in Los Angeles County, California. The Project location is shown in Figure ES-1.

Project Objectives

California Environmental Quality Act (CEQA) Guidelines Section 15124(b) require the project description to include a statement of objectives for the proposed project, including the underlying purpose of the proposed project. Project objectives provide a standard against which to measure project alternatives: they must substantially meet the Project objectives.

The applicant's Project objective is to continue oil production at the existing drill sites for another 20 years, including drilling new wells, to continue to support the energy needs of California. The City's objective is to respond to SHP's request for a CUP extension, determine an appropriate duration for the CUP term and either approve, approve with conditions, or revoke the CUP.

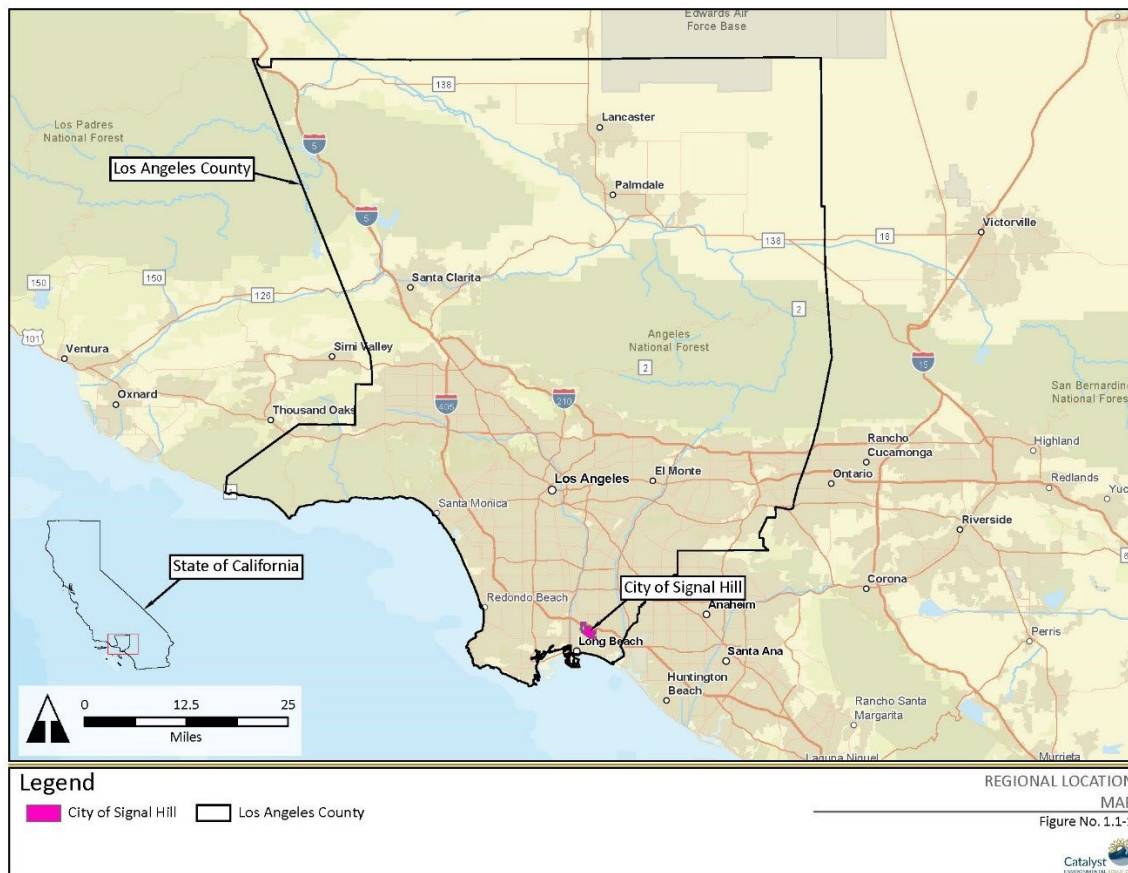


Figure ES-1: Project Location Map

Project Overview

The Project does not include any amendments or modifications to the CUP that would expand the types of operational activities authorized under the CUP’s existing terms. The existing CUP boundaries would not change or expand under the proposed Project, and all operations (existing and proposed) would continue to occur within the existing permitted CUP footprint. The Project consists of three distinct activities.

Continued Operations - SHP would continue their existing operations at the current activity level for the duration of the CUP extension. The activities consist of continued operations of all existing wells; well servicing and maintenance; redrilling operations (with a limit of 28 wells during the CUP term); oil processing, storage and transfer; soils management; natural gas and natural gas liquids processing, storage, and transfer; produced water separation and injection; and electrical production from a natural gas turbine-powered generator. Additionally, SHP obtained a permit to install a natural gas flare at Drill Site #2 in 2022. The purpose of the flare is to increase the efficiency of the existing turbine and gas plant and the proposed gas plant

modifications in order to sell gas to SoCal Gas. Installation is currently underway and the flare is anticipated to be operational in 2024.

New Wells and Well Cellars - SHP proposes to drill a maximum of 46 new wells within the seven drill sites over the 20-year period, at a maximum rate of five wells per year. All new wells would be located within the existing drill site boundaries and may be drilled within the existing open slots in the well cellars already present on site or in new well cellars that could be constructed within the existing drill sites.

Upgrades to Natural Gas Processing Facility - SHP proposes to upgrade the natural gas processing facility at Drill Site #2 to facilitate sale of excess natural gas to Southern California Gas Company and promote efficiency and redundancy in operations.

Environmental Review Process

Approval of conditional use permits is a discretionary decision by the City of Signal Hill City Council in accordance with Section 20.08.050 of the City of Signal Hill Municipal Code. The Project involves discretionary action by the City and, therefore, it is subject to the provisions of CEQA. This Environmental Impact Report (EIR) has been prepared in conformance with CEQA (Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (Title 14, California Code of Regulations, Section 15000 et seq.).

This EIR is released in draft form (Draft EIR) for a 45-day public review period. A public meeting will be held to solicit additional input from interested parties on the content and conclusions reached in the Draft EIR. All comments received on the Draft EIR during the public review period will be addressed in the Final EIR. The Final EIR will include comments and responses, as well as any changes made to the document.

As Lead Agency, the City will consider certification of the EIR and, subsequently, will consider whether to approve the Project.

Purpose and Use of the EIR

The purpose of this document is to inform governmental decision-makers and the public about the potential significant environmental effects associated with the Project. As described in CEQA Guidelines Section 15121(a), an EIR is a public information document that assesses the potential environmental impacts of a proposed project and identifies mitigation measures and alternatives to the project that could reduce or avoid adverse environmental impacts. It is not the purpose of the EIR to recommend either approval or denial of a project. Rather, the EIR serves to provide full disclosure of potential environmental impacts of the proposed Project for the City of Signal Hill's review and consideration.

Lead Agency

The lead agency is the public agency that has the greatest responsibility for carrying out or approving a project which may have a significant effect upon the environment (Public Resources Code Section 21067). The City of Signal Hill is the primary permitting agency and governmental body responsible for approval and ongoing oversight of the proposed Project and therefore serves as the lead agency responsible for compliance with CEQA. The City of Signal Hill has the authority to approve the extension of CUP 97-03 and would continue to ensure that SHP's operations remain in compliance with the requirements of the CUP 97-03 and the City's Oil and Gas Code (Signal Hill Municipal Code – Title 16).

Required Permits and Consultations

Responsible agencies in CEQA include all public agencies, besides the lead agency, with discretionary permitting authority over the Project. SHP's oil field operations are subject to numerous permit requirements and additional agency oversight. Project implementation would require permits to drill new wells or rework existing wells, which are under the authority of the California Geologic Energy Management Division (CalGEM).¹ SHP's existing water-injection operations are subject to Class II Underground Injection Control permits with monitoring and other requirements established by CalGEM.

The Project requires approvals from the South Coast Air Quality Management District (SCAQMD) related to operation of the gas plant. SCAQMD is the local agency with jurisdiction over air emissions in the region. SCAQMD would use this environmental analysis to support their permitting decisions related to permits to construct and permits to operate stationary sources at the drill sites. SHP maintains various SCAQMD permits for applicable facilities within the drill sites.

The majority of the SHP drill sites are exempt from the Industrial General Permit, in accordance with Section I.B.23 of the Regional Water Quality Control Board's Industrial General Permit Order 2014-0057-DWQ and relatedly Section 402(l)(2) of the Clean Water Act. Specifically, all drill sites covered under CUP 97-03 are considered exempt from the Industrial General Permit through either an approved Notices of Non-Applicability or through termination coverage, as the sites do not have the potential to discharge to Waters of the United States, with the exception of CUP Site #5, which currently maintains coverage under the Industrial General Permit and implements a Stormwater Pollution Prevention Plan.

Assembly Bill 52 (AB 52) directs the lead agency preparing the CEQA document to consult with Native American Tribes. Pursuant to AB 52, on December 8, 2022, the City sent consultation notification letters to the following tribes: Gabrieleño Tongva Indians of California Tribal

¹ The Oil Services Coordinator also oversees these operations, and the City is responsible for issuing ministerial permits following issuance of CalGEM permits as per Title 16 of the Municipal Code.

Council, Gabrieleño Tongva San Gabriel Band of Mission Indians, Gabrieleño Tongva Nation of Greater Los Angeles Basin, and Gabrieleño Band of Mission Indians-Kizh Nation.

Summary of Environmental Impacts and Mitigation Measures

An Initial Study was prepared which analyzed potential impacts of the proposed Project on all resource areas. The Initial Study was published with the NOP on January 12, 2023 and is available online at: <https://ca-signalhill2.civicplus.com/DocumentCenter/View/15215/Initial-Study---Drill-Sites-CUP>. The Initial Study is incorporated by reference in this Draft EIR in accordance with State CEQA Guidelines Title 14 Section 15150. As described in the Initial Study, under implementation of the proposed Project, no impacts would occur to agriculture and forestry resources, land use and planning, mineral resources, population and housing, public services, and recreation, and impacts would be less than significant for utilities and service systems, and wildfire. Therefore, these resource areas were not discussed further in this EIR.

This EIR includes the environmental factors which were determined by the Initial Study to be potentially affected by the project. As described in the EIR, under implementation of the proposed Project, all impacts identified would be less than significant or are able to be mitigated to less than significant levels. No significant and unavoidable adverse impacts were identified.

Alternatives to the Proposed Project

An important aspect of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the significant impacts of a proposed Project. In addition to requiring consideration of the No Project Alternative, the CEQA Guidelines (Section 15126.6(d)) emphasize the selection of a reasonable range of feasible alternatives that substantially meet the Project objectives, and adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision-makers.

In addition to the required No Project Alternative, the following alternatives were identified through the public scoping process: 1) approval of the CUP extension with a condition which would prohibit new wells, 2) approval of the CUP extension but for a shorter duration of time (10 years), and 3) approval of the CUP extension for a shorter duration (2 years). The City considered each of these potential alternatives and determined that all are technically feasible, and that all would substantially meet the Project objective of continued oil production, although to a lesser degree than the proposed Project; however, because the current oil and gas operations are authorized by the State Department of Conservation, Geologic Energy Management Division (CalGEM would be allowed to continue for as long as allowed by the State even absent a CUP. Therefore, this potential alternative is not considered further because

it does not add to the range of feasible alternatives. The No Project Alternative and the 10-year and 2-year CUP extension alternatives were carried forward for analysis in this EIR.

No Project Alternative

Under the No Project Alternative, the City would not approve the 20-year extension of the CUP for the continued operation of the seven drill sites currently operated by SHP and would revoke Signal Hill Petroleum's CUP. According to the City of Signal Hill Municipal Code Sections 1212.050, 1616.010, and 1616.020, if the City revokes the CUP, existing operations at the seven drill sites could continue but SHP would no longer be able to drill any new wells. As such, no new well cellars would be constructed. SHP would be required to continue paying annual fees to the City for all existing wells. Comments received during the scoping period suggested the City consider an alternative that would allow continued operation of the drill sites but prohibit the drilling of new wells. The No Project Alternative evaluates the potential effects of this "no new wells" alternative, as identified during scoping.

Under the No Project alternative, SHP would continue to operate in accordance with all other applicable local (e.g. SCAQMD) and state (e.g. CalGEM) regulations. Without an active CUP, all operations at the seven drill sites would continue without City oversight or existing CUP conditions of approval. SHP would not be able to drill new wells but would be able to continue to conduct redrill operations on existing wells. It is reasonably foreseeable that without the ability to drill new wells, SHP would conduct redrill operations more frequently than the maximum of six per year proposed to maintain production rates. Furthermore, since redrill activities are similar in scope and duration to new drills, and have similar environmental emissions, an increase in redrills would potentially have greater impacts than the Project.

The CUP provides a clear set of conditions for operations of each of the drill sites which have been developed to address potential issues related to community compatibility such as noise, traffic, aesthetics, and security. Further, mitigation measures proposed within this EIR to reduce environmental impacts would also not be implemented. Therefore, while this alternative would avoid potential air and greenhouse gas emissions associated with the drilling and operation of 46 new wells, the potential for significant impacts related to continued operations would be greater under the No Project Alternative than the proposed Project.

Alternative 1: 2-Year Permit Term

Under Alternative 1, the City would approve the renewal of the CUP for the drill sites for another 2-year period, instead of the 20-year period requested by SHP. This alternative would include all aspects of existing operations at the seven drill sites, but the number of new wells likely to be drilled over the CUP period, and the associated number of new wells cellars constructed, would be reduced to 10 (as SHP as indicated that the maximum number of wells they would drill in a given year is five). At the end of the 2-year permit term, the City could elect

to renew the CUP or revoke the CUP. If the City were to revoke the CUP at the end of the 2-year permit period, 36 of the proposed 46 new wells would not be drilled. As a result, selection of Alternative 1 would avoid emissions of criteria air pollutants and greenhouse gases associated with the construction of 10 well cellars and drilling and operation of 36 wells. However, as described under the No Project Alternative, if after two years the CUP were revoked, SHP's existing operations at the seven CUP Sites would continue without an active CUP in accordance with the City's municipal code, including redrilling of existing wells.

Alternative 2: 10-Year Permit Term

Under Alternative 2, the City would approve renewal of the CUP for the drill sites for a 10-year period, instead of the 20-year period requested by SHP. This alternative would include all aspects of existing operations at the seven drill sites, and considering the maximum number of wells that may be drilled in a given year (5), SHP would still drill up to 46 additional wells within the footprint of the drill sites (i.e., the maximum number of new wells proposed by SHP drilled at the maximum rate of five wells per year). At the end of the 10-year permit term, the City could elect to renew the CUP or revoke the CUP. Given that SHP's CUP permit has been renewed and extended numerous times since 1998, it is reasonably foreseeable that the City would extend the CUP at the end of the 10-year permit period. However, if the City were to revoke the CUP at the end of the 10-year permit period, SHP would continue to operate the drill sites, including all 46 wells drilled during the 10-year permit term. Further, while the maximum number of wells that SHP may drill in a year is set at five, on average SHP would plan to drill two wells per year. Therefore, if the permit term is set to ten years it is more likely that SHP would elect to drill the maximum number of wells allowed per year before the end of the permit term, thus resulting in potentially higher air and greenhouse gas emissions on an annual basis. In addition, if the permit is revoked after the 10-year term, SHP's existing operations at the seven CUP Sites would continue without an active CUP in accordance with the City's municipal code, including redrilling of existing wells.

Comparison of Alternatives

A comparative summary of the potential impacts under each alternative is provided in Table ES-1.

Environmentally Superior Alternative

The State CEQA Guidelines (Section 15126.6(d)) require that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project.

The No Project Alternative would avoid the short-term oil well development impacts of the Project as no new wells would be drilled which would reduce project-related impacts associated with air quality and greenhouse gases. The No Project Alternative would achieve the

objective of the Project to continue oil production at the drill sites, although total production would decrease year over year as production declines in the existing wells. However, the No Project Alternative would not be environmentally superior to the Project because it would result in potentially significant impacts as SHP would not be required to implement any mitigation measures or CUP conditions of approval and would be operating without City oversight and enforcement. It is reasonably foreseeable that without the ability to drill new wells, SHP would conduct redrill operations more frequently than the maximum of six redrills of existing wells per year under the proposed Project to maintain production rates.

Based on the analysis provided in this EIR, the City of Signal Hill has determined that the Project is the environmentally superior alternative. With the implementation of the mitigation measures described in this EIR, all impacts would be less than significant. Under the 10-year permit term alternative, SHP would be able to drill all the wells proposed under the Project, and if the CUP is revoked, may also conduct redrill operations more frequently than proposed. Therefore, impacts under the 10-year permit term may be greater than described for the Project. While fewer new wells may be drilled and fewer well cellars constructed under the 2-year permit term, if the CUP is revoked at the end of 2 years, SHP may conduct redrill operations more frequently than proposed and the drill sites would continue to be operated without implementation of mitigation measures or CUP conditions of approval.

Table ES-1. Summary of Project and Alternative Environmental Impacts and Mitigation Measures

Would the Project?	Project	No Project Alternative	Alternative 1 – 2 Year Permit Term	Alternative 2 – 10 Year Permit Term
Aesthetics				
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	Less than Significant with Mitigation	Reduced	Reduced	Similar
Air Quality				
a) Conflict with or obstruct implementation of the applicable air quality plan?	Less than Significant	Similar	Similar	Similar
b) 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?	Less than Significant	Reduced	Reduced	Greater
c) Expose sensitive receptors to substantial pollutant concentrations?	Less than Significant	Reduced	Similar	Greater
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	Less than Significant	Reduced	Reduced	Similar
Biological Resources				
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 Wildlife or U.S. Fish and Wildlife Service?	Less than Significant with Mitigation	Reduced	Reduced	Similar
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?	Less than Significant with Mitigation	Reduced	Reduced	Similar
Cultural Resources				

Would the Project?	Project	No Project Alternative	Alternative 1 – 2 Year Permit Term	Alternative 2 – 10 Year Permit Term
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	Less than Significant	Avoided	Greater	Greater
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	Less than Significant with Mitigation	Avoided	Greater	Greater
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	Less than Significant	Greater	Greater	Similar
Energy				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	Less than Significant	Reduced	Reduced	Similar
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	Less than Significant	Avoided	Reduced	Similar
Geology and Soils				
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Less than Significant with Mitigation	Reduced	Reduced	Similar
Greenhouse Gas Emissions				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Less than Significant	Reduced	Reduced	Greater
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Less than Significant	Avoided	Similar	Similar
Hazards and Hazardous Materials				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Less than Significant	Similar	Similar	Similar

Would the Project?	Project	No Project Alternative	Alternative 1 – 2 Year Permit Term	Alternative 2 – 10 Year Permit Term
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?	Less than Significant	Similar	Similar	Similar
c) 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	Similar	Similar	Similar
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	Less than Significant	Similar	Similar	Similar
Hydrology and Water Quality				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	Less than Significant	Similar	Similar	Similar
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	Less than Significant	Similar	Similar	Similar
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i. result in a substantial erosion or siltation on- or off-site; ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; iii. 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;	Less than Significant	Avoided	Reduced	Similar
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	Less than Significant	Similar	Similar	Similar
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	Less than Significant	Similar	Similar	Similar
Noise				

Would the Project?	Project	No Project Alternative	Alternative 1 – 2 Year Permit Term	Alternative 2 – 10 Year Permit Term
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less than Significant with Mitigation	Reduced	Reduced	Similar
b) Generation of excessive groundborne vibration or groundborne noise levels?	Less than Significant	Reduced	Reduced	Similar
c) For a project located within the vicinity of a private airstrip or 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?	Less than Significant	Similar	Similar	Similar
Transportation				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	Less than Significant with Mitigation	Greater	Greater	Greater
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	Less than Significant	Similar	Similar	Similar
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	Less than Significant	Similar	Similar	Similar
d) Result in inadequate emergency access?	Less than Significant	Similar	Similar	Similar
Tribal Cultural Resources				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	Less than Significant with Mitigation	Similar	Similar	Similar

Would the Project?	Project	No Project Alternative	Alternative 1 – 2 Year Permit Term	Alternative 2 – 10 Year Permit Term
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.				
Utilities and Service Systems				
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	Less than Significant	Reduced	Reduced	Similar
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	Less than Significant	Similar	Similar	Similar

SECTION 1 Introduction

1.1 Overview of the Proposed Project

Signal Hill Petroleum (SHP) operates seven drill sites in the City of Signal Hill under Conditional Use Permit 97-03 (CUP) (Figure 1.1-1). The CUP, first issued in 1998, has been renewed multiple times. Most recently, the City renewed the CUP for a 2-year term in July 2021 which expires on July 30, 2023. SHP has requested the City issue a long-term (20-year) renewal of the CUP to continue operations (the Project). Renewal of a long-term extension of the CUP by the City of Signal Hill is a discretionary decision that triggers compliance with the California Environmental Quality Act (CEQA). As part of the Project, SHP proposes to continue existing operations at all seven drill sites (including re-drilling activities such as deepening, sidetracking, and reworking to as many as 26 existing wells over the proposed 20-year period), conduct upgrades to the gas processing facility at Drill Site #2, and drill up to 46 additional wells within the footprint of the drill sites. The Project would not change the footprint of the drill sites, or the levels of activity associated with operating and maintaining the equipment at the drill sites.

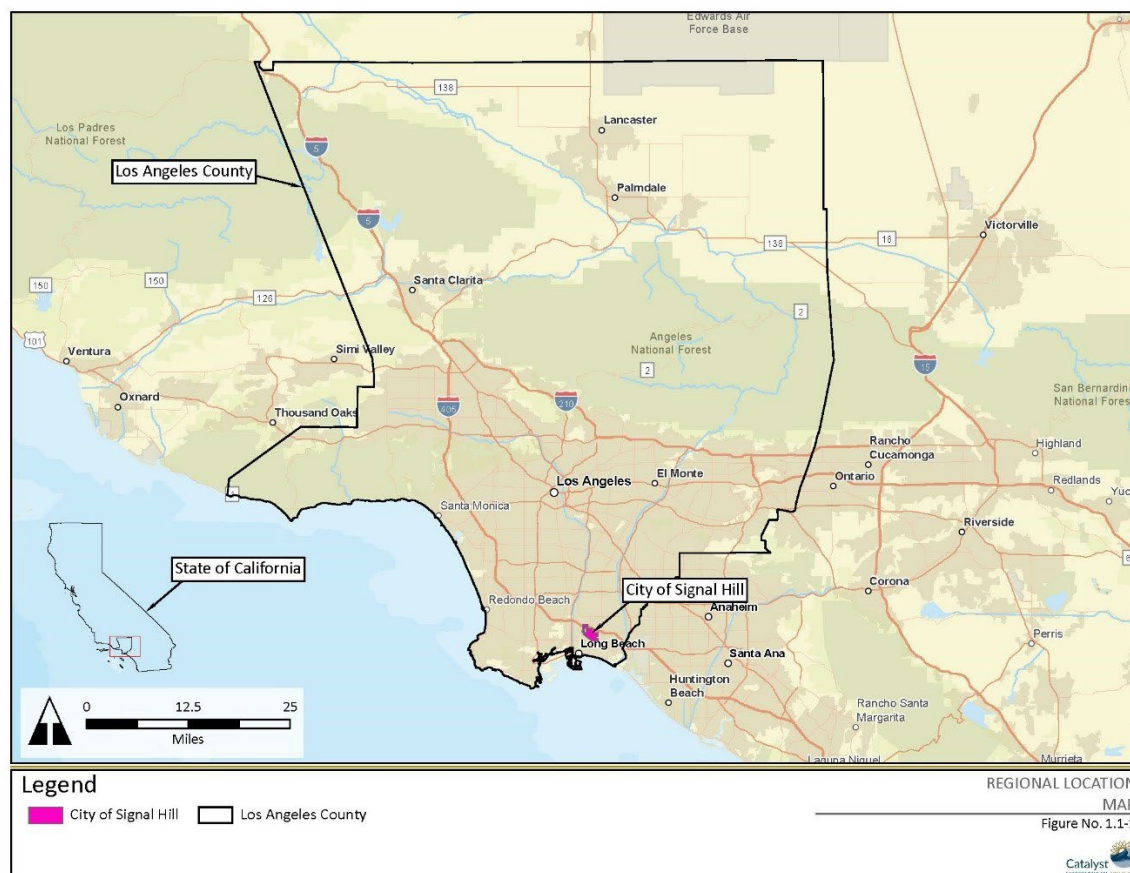


Figure 1.1-1: Project Location Map

1.2 Project Background and History

Prior to SHP acquisition, the various drill sites throughout the City of Signal Hill were owned by ARCO, Shell, and Texaco and each site was operated under a separate CUP. SHP began acquiring drill sites in 1984, and once they acquired all seven drill sites, the City consolidated the CUP to cover all sites under one permit, CUP 97-03. Table 1.2-1 summarizes each CUP approval and the associated environmental review.

The City Council first approved CUP 97-03 on June 16, 1998. CUP 97-03 allowed SHP to continue their existing oil and gas production, storage, processing, and shipping of materials at the seven CUP drill sites under one, consolidated permit. The CUP approval also included 18 conditions of approval, including an annual review by the City through an inspection by the Oil Services Coordinator, and an initial approval term of 5 years. As part of the CUP approval, the City adopted a Mitigated Negative Declaration (MND), pursuant to CEQA. The MND contained 14 mitigation measures pertaining to geophysical, water quality, air quality, hazards, noise, and aesthetics, which were incorporated into the CUP conditions of approval. These mitigation measures remain applicable to SHP's existing operations and, if the CUP extension is approved, would continue to be implemented as part of the Project.

On October 1, 2002, prior to expiration of CUP 97-03, SHP requested to amend the permit to include a new natural gas-powered turbine/electric generation facility to be located at CUP Site #2. The electrical generation facility is powered by natural gas produced by SHP's extraction sites, as well as natural gas produced by other independent oil operators in the Signal Hill/Long Beach area, which reduced SHP's need to purchase offsite power. This facility provides 75% of the electricity required to power SHP's oil operations in the Long Beach Oil Field. The remaining 25% of electricity required to power SHP's oil operations is provided by Southern California Edison. The 2002 CUP amendment was approved, and the term was extended for 10 years (until October 1, 2012). A subsequent MND was approved by the City to address SHP's proposed amendments to CUP 97-03. As part of approval of the CUP amendment, five new conditions related to the power plant and one additional mitigation measure identified in the subsequent MND related to noise were added to the CUP as conditions of approval.

The CUP was again extended for another two-year period on September 4, 2013. The City filed a Notice of Exemption in accordance with CEQA for this extension. The City approved another short-term extension of the CUP until February 20, 2014, which included new conditions for landscaping. SHP installed landscaping and maintenance improvements in January 2014 to comply with the additional conditions.

On January 14, 2014, the Planning Commission held a duly noticed public hearing and unanimously recommended City Council approval of another 6-month extension to allow time to complete applicable technical studies being prepared for the City amending their Oil and Gas Code. The approval extended the term of the CUP to January 4, 2015.

In November 2014, as the third extension expiration approached, the City met with SHP to discuss next steps and a time frame. A 30-month extension was agreed upon to allow time to prepare a comprehensive development agreement intended to allow development of multiple properties (i.e., residential and commercial development) as well as a combined environmental document that analyzed both the development agreement and a long-term extension of the CUP. The City extended the term of the CUP to June 30, 2017. Since 2017, subsequent one- to two-year term extensions for CUP 97-03 have been approved, having been reviewed by both the Planning Commission and City Council up to present day. The most recent extension was approved by the City Council on August 10, 2021, for a two-year term, and the CUP is currently set to expire on July 30, 2023. After expiration, the CUP and associated conditions remain in effect until and unless the CUP is officially revoked by the City Council. As such, the current CUP remains administratively extended and in effect until such time that a new CUP is adopted by the City Council upon completion of this CEQA review.

Table 1.2-1: Summary of CUP 97-03 History

CUP Approval Date	Details	Permit Term	CUP Expiration Date	CEQA
June 16, 1998	Initial CUP 97-03 Approval	5 years	June 2003	IS/MND adopted
October 1, 2002	City amends CUP 97-03 to include electrical generation facility at Drill Site #2	10 years	October 1, 2012	Subsequent IS/MND adopted
October 1, 2012	City approves CUP extension	1 year	September 3, 2013	
September 4, 2013	City approves CUP extension	6 months	February 20, 2014	Class I Exemption – Existing Facilities
February 4, 2014	City approves CUP extension	1 year	December 31, 2014	
December 2, 2014	City approves CUP extension	2.5 years	June 30, 2017	
June 13, 2017	City approves CUP extension	1 year	June 30, 2018	
June 12, 2018	City approves CUP extension	1 year	June 30, 2019	
June 11, 2019	City approves CUP extension	1 year	June 30, 2020	
August 10, 2021	City approves CUP extension	2 years	July 23, 2023	

1.3 Project Objective

The applicant's project objective is to continue oil production at the existing CUP sites, including the drilling of new wells, for another 20 years to continue to support the energy needs of California. The City's objective is to respond to SHP's request for CUP extension, determine an appropriate duration for the CUP term and either approve, approve with conditions, or revoke the CUP. As CEQA lead agency, the City is considering the proposed Project as a whole, which includes another 20 years of continued operations of the existing drill sites as well as the additional activities which SHP has proposed during the 20-year timeframe.

1.4 Purpose of the Environmental Impact Report

CEQA applies to projects initiated by, funded by, or requiring discretionary approvals from California state or local government agencies. Approval of conditional use permits is a discretionary decision by the City of Signal Hill City Council in accordance with Section 20.08.050 of the City of Signal Hill Municipal Code. As a proposal which requires discretionary approval from the city, the Project constitutes a "project" as defined by CEQA (California Public Resources Code [PRC] Section 21000 et seq.). The City of Signal Hill has prepared this Environmental Impact Report (EIR) to evaluate the potential environmental impacts of the Project in advance of deciding whether to approve CUP 97-03 for a 20-year extension, and if so, whether any additional conditions of approval are necessary to minimize or avoid environmental impacts.

1.5 Lead Agency

CEQA Guidelines Section 15367 states that a Lead Agency is "the public agency which has the principal responsibility for carrying out or approving a project." The City of Signal Hill is the primary permitting agency and governmental body responsible for approval and ongoing oversight of the proposed Project and therefore serves as the lead agency responsible for compliance with CEQA. The City of Signal Hill has the authority to approve the extension of CUP 97-03 and would continue to ensure that SHP's operations remain in compliance with the requirements of the CUP 97-03 and the City's Oil and Gas Code (Signal Hill Municipal Code – Title 16). Title 16 regulates oil production facilities and operations and sets out the standards for development around active wells and over and around abandoned oil wells. The Oil Services Coordinator is the primary inspector for the City regarding enforcement of the Oil Code. In addition, the City is responsible for issuing a ministerial permit for drilling new wells, re-drilling existing wells, and installing new well cellars. These activities also require inspections by the Oil Services Coordinator.

1.6 Responsible Agencies

Responsible agencies in CEQA include all public agencies, besides the lead agency, with discretionary permitting authority over the Project. SHP's oil field operations are subject to numerous permit requirements and additional agency oversight. However, the only other discretionary permitting action required for Project implementation are permits to drill new wells or rework existing wells, which are under the authority of the California Geologic Energy Management Division (CalGEM)², and approvals from the South Coast Air Quality Management District (SCAQMD) related to operation of the gas plant.

CalGEM is the state agency that oversees surface and subsurface operations of oil, gas, and injection wells; well exploration, drilling, and construction; well testing; well completion, stimulation, and workovers; oil and gas operations and maintenance; and well removal, plugging, and abandonment. SHP's existing water-injection operations are subject to Class II Underground Injection Control permits with monitoring and other requirements established by CalGEM. As a responsible agency, CalGEM would use this environmental analysis to support their permitting decisions related to Notices of Intent for new wells, reworks, sidetracks, deepening, abandonments and reabandonments at the CUP drill sites³, as well as periodic reviews of SHP's existing Class II Underground Injection Control permit.

SCAQMD is the local agency with jurisdiction over air emissions in the region. As a responsible agency, SCAQMD would use this environmental analysis to support their permitting decisions related to permits to construct and permits to operate stationary sources at the CUP drill sites.

1.7 Public Participation

CEQA encourages the Lead Agency to have early public consultation directly with any person or organization it believes will be concerned with the environmental effects of a project. The following sections describe the public outreach activities completed by the City to date for the

² The Oil Services Coordinator also oversees these operations, and the City is responsible for issuing ministerial permits following issuance of CalGEM permits as per Title 16 of the Municipal Code.

³ In October 2022, the Governor of California signed into law Senate Bill 1137 which add Article 4.6, titled "Health Protection Zones," to Chapter 1 of Division 3 of the Public Resources Code, Article 4.6 defined health protection zones as those areas within 3,200 feet of any active or idle oil and gas wells. The law set forth a series of new regulations for monitoring and operating all wells currently existing within a health protection zone and prohibited CalGEM from issuing any permits for drilling new wells or redrilling existing wells within the health protection zone. A referendum in opposition with the legislation was filed with the Secretary of State in December 2022. On February 3, 2023, the Secretary of State certified that a sufficient number of signatures had been submitted for the referendum to become duly qualified for the ballot. The effectiveness of a statute challenged in its entirety by a duly qualified referendum is stayed until it has been approved by the voters at the required election. (Assembly of State of Cal. v. Deukmejian (1982) 30 Cal.3d 638, 656; Cal. Const., art. II, §§ 9, 10.) Thus, by operation of law, the implementation of Senate Bill 1137's statutory provisions is stayed as of February 3, 2023, until the referendum challenge has been resolved by a vote of the electorate, and the provisions of Senate Bill 1137 are not addressed further in this EIR. However, this EIR analyzes potential for human health risks in comparison to established thresholds of significance.

Project, including publishing a Notice of Preparation (NOP)/Initial Study, holding a public scoping meeting, and developing a summary of the comments received through the public scoping process. A copy of the NOP/Initial Study, and comment letters received are included in Appendix A.

1.7.1 Scoping Process

In accordance with CEQA Guidelines Section 21092, the City of Signal Hill published the NOP/Initial Study for the Project on January 13, 2023, which marked the start of the 30-day scoping period. The NOP/Initial Study was submitted to the Los Angeles County Clerk and California State Clearinghouse (SCH# 2023010217) and was also published on the City of Signal Hill website and in the Signal Hill Tribune. In addition, the City of Signal Hill mailed notices to all property owners located within 300 feet of all CUP drill sites.

The City hosted an in-person scoping meeting at Signal Hill City Hall, with a virtual online attendance option, on January 30, 2023, from 6:00-8:00 p.m. to solicit comments about the scope and content of the proposed EIR. The meeting followed a town hall format with four public attendees, two in-person and two virtual.

1.7.2 Summary of Comments Received During Scoping

During the scoping period, four oral comments were provided and 13 comment letters were submitted by email. Table 1.7-1 summarizes the comments received and indicates the location within this EIR that the issue is addressed.

Table 1.7-1: Summary of Scoping Comments Received

Issue Raised During Scoping	Location of Discussion within EIR
Global climate change and greenhouse gas emissions	Section 3.6 Greenhouse Gas Emissions
Potential for impacts to public health and residences living in close proximity to drill sites	Section 3.7 Hazards and Hazardous Materials
Potential emissions of criteria pollutants and odors	Section 3.2 Air Quality
Questions regarding how much water is used during SHP operations and source of potable water	Section 2.4.1.7 Water Demand, Consumption, Disposal; Section 3.8 Hydrology and Water Quality
Suggestions to consider alternatives for shorter permit term or limiting the number of wells drilled	Section 4 Alternatives to the Proposed Project
Request to provide data on the potential energy resources associated with drilling new well cellars	Section 3.5 Energy
The EIR must include a much more detailed description to enable a review of environmental impacts	Section 2 Project Description
Provide information on how and where SHP intends to drill more wells	Section 2 Project Description

Issue Raised During Scoping	Location of Discussion within EIR
Several assumptions about the pace of redrilling and new drilling were made, without establishing whether there will be limits in the permit.	Section 2 Project Description
Provide information about the waste generation associated with each site.	Section 3.13 Utilities and Service Systems
The need to consider potential environmental justice effects	Section 3.14 Cumulative Effects
Cumulative impacts on the environment	Section 3.14 Cumulative Effects

SECTION 2 Project Description

2.1 Project Summary

The City permitted seven oil and gas drill sites located within the City of Signal Hill under CUP 97-03 since 1998 (CUP sites) and is considering adoption of a 20-year extension of the CUP (Project). During the 20-year extended CUP period, SHP proposes to install new equipment at the existing natural gas processing facility at Drill Site #2 and drill up to 46 new wells which may be located within any of the seven drill sites. All other operational activities, such as site maintenance, inspections, re-drilling and well operation and fluid processing would remain the same.

The seven drill sites under CUP 97-03 are existing and currently active oil production-related facilities. In addition to oil and gas extraction, central processing facilities are located at Drill Sites #2 and #5, including a central water plant used for the recovery of petroleum hydrocarbons (Drill Site #5), and a natural gas processing/power generation facility (Drill Site #2). Drill Site #6 is an inactive processing site that houses out-of-service tanks that cannot be used for storage or processing, per State regulations and City of Signal Hill Municipal Code. Due to equipment and work area requirements, the drill sites are generally absent of any substantial landscaping of the interior areas, although perimeter landscaping and/or decorative concrete block walls/fencing surround each of the sites to provide visual screening in accordance with the City's Oil and Gas Code (Title 16).

The Project does not include any amendments or modifications to the CUP that would expand the types of operational activities authorized under the CUP's existing terms. The existing CUP boundaries would not change or expand under the proposed Project, and all operations (existing and proposed) would continue to occur within the existing permitted CUP footprint. SHP would continue to operate the drill sites in accordance with the Conditions of Approval specified in CUP 97-03, which are under review as part of the CUP renewal process. The Conditions of Approval would be amended to incorporate as conditions the mitigation measures adopted through the CEQA process, as well as to specify limits on the maximum number of wells that may be drilled or re-drilled in a given year to align with the project description submitted by SHP. In addition, the Conditions of Approval would be updated by the City to remove those conditions that are no longer applicable to current operations or for which a required action has been completed, and new conditions may be added based on new, or updated information and the EIR Mitigation Measures will be referenced. The Conditions of Approval which were approved as part of the current CUP are listed in Table 2.1-1 below.

Table 2.1-1: Existing Conditions of Approval in the Current Conditional Use Permit

Condition #	Description
	General Conditions
1	Operation of the Consolidated Drilling and Oil Production Sites will be consistent with the applications dated July 31, 1997, and August 15, 2002, on file with the Department of Community Development.
2	Any substantial modification to the approved plans, or any amendment to the conditions of approval, as determined by the Director of Community Development, shall be referred to the Planning Commission and City Council for review and approval.
3	A "Consolidated Drilling and Oil Production Site," or "Drill Site," means an area where the operator may drill, re-drill or produce wells for removing oil and/or gas, or for injecting water or other approved substances to assist with the recovery of oil and/or gas and where said products may be gathered, distributed and/or separated (i.e., processed) under conditions specified in a City approved conditional use permit.
4	"Discontinuation" of a Consolidated Drilling and Oil Production Site means an operator no longer intends to use the area for drilling, re-drilling, producing, injecting or processing and has informed the City of said intent in writing
	Enforcement Conditions
5	Buildings and additions are subject to Signal Hill Municipal Code Chapter 20.52, entitled, "Site Plan and Design Review." A fence or decorative masonry block wall shall enclose all Consolidated Drilling and Oil Production Sites. Gates shall complement the appearance of the fence or wall as determined by the Director of Community Development. The operator shall maintain fences, walls and gates, and remove or paint over graffiti and excessive staining as directed by the Oil Services Coordinator.
6	No structures, including tanks, shall exceed forty (40) feet except that the height of the emissions stack for the gas turbine power plant at 1215 29th Street shall not exceed forty-five (45) feet and no pumping unit shall exceed fifty (50) feet in height above existing grades.
7	The operator shall notify the City of any proposed change in operator at least thirty (30) days before said change takes effect.
8	The operator shall allow the Oil Services Coordinator or his designee access to all sites subject to this Conditional Use Permit as required by Signal Hill Municipal Code Section 16.04.060, entitled, "Right-of-Entry." All drilling, re-drilling, producing, injecting or processing facilities shall be subject to inspection by the Oil Services Coordinator. At least one time per year, the Oil Services Coordinator shall inspect every consolidated drill site for compliance with these Conditions of Approval.
9	As security for payment of any financial obligations of Applicant hereunder, Applicant shall record a security instrument against one Consolidated Drilling and Oil Production Site with lien rights, subject to foreclosure by the City for failure to pay any amount when due. This security shall be in a first position on a Drill Site approved by the City Attorney. The single drill site shall serve as security for violations at any of the seven drill sites. The security instrument shall be in a form approved by the City Attorney. The City may proceed against the security, if Applicant fails to pay any obligation hereunder within thirty (30) days, following the City's written request for payment. In the event Applicant pays under protest, Applicant shall have the appeal rights as listed in Condition No. 8.
10	Violation of any conditions of approval shall constitute grounds for this Conditional Use Permit to be revoked following notice and a public hearing before the Planning Commission. Any decision of the

Condition #	Description
	Planning Commission regarding revocation of the Conditional Use Permit may be appealed to the City Council and the City Council has the final decision-making authority.
	Operating Conditions
11a	The operator shall notify the Oil Services Coordinator of any work for which a permit is required and obtain all required permits as required by Signal Hill Municipal Code Section 16.04.050, entitled, "Inspection," and Signal Hill Municipal Code Section 16.12.020, entitled, "Permits Required." The operator may maintain an annual electrical permit as prescribed.
11b	The operator shall maintain access roads so as to minimize erosion as required by Signal Hill Municipal Code Section 16.16.040, entitled, "Drill Site Grading, Drainage and Surfacing," and Signal Hill Municipal Code Section 16.20.010, entitled, "Grading Drainage and Surfacing."
11c	During drilling operations, the operator shall maintain a minimum of five off-street parking spaces at each Consolidated Drilling and Oil Production Site as required by Signal Hill Municipal Code Section 16.16.050, entitled, "Off-Street Parking."
11d	The operator shall, during drilling operations, maintain sanitary facilities at the Consolidated Drilling and Oil Production Site as required by Signal Hill Municipal Code Section 16.16.060, entitled, "Sanitary Facilities."
11e	The operator shall maintain signs at each Consolidated Drilling and Oil Production Site as required by Signal Hill Municipal Code Section 16.16.080, entitled, "Signs," and Signal Hill Municipal Code Section 16.16.060, entitled, "Signs and Identification."
11f	The operator shall, during drilling operations, maintain blow out prevention equipment in accordance with Signal Hill Municipal Code Section 16.16.090, entitled, "Blow-out Prevention," and all applicable State requirements.
11g	The operator shall maintain cellars free of oil, water and debris and in safe and working order as required by Signal Hill Municipal Code Section 16.16.100, entitled, "Cellars," and Signal Hill Municipal Code Section 16.20.080, entitled, "Cellars and Stumps."
11h	The operator shall arrange light fixtures so that light is not directed at neighboring property owners or tenants. All lighting shall be consistent with Signal Hill Municipal Code Section 16.20.070, entitled "Lighting."
11i	The operator shall maintain paint on all equipment. Equipment and tanks shall be painted a neutral color. Any change in color is subject to approval by the Director of Community Development. Tanks and equipment shall be repainted periodically as reasonably necessary and as determined by the Oil Services Coordinator.
	Noise Conditions
12a	The operator shall only deliver to or remove equipment and materials from any of the Consolidated Drilling and Oil Production Sites between the hours of 7:00 a.m. and 7:00 p.m. except emergencies.
12b	The operator shall use electric motors to power equipment. Vehicle motors, including portable service or drilling rigs, may use internal combustion engines that comply with AQMD standards.
12c	The Director of Community Development may approve internal combustion engines for gas processing equipment if noise levels as measured at the Drill Site boundaries can be maintained within the noise levels allowed by the Signal Hill Municipal Code Chapter 9.16.
12d	The operator shall provide noise controls as required by Signal Hill Municipal Code Sections 16.16.110, entitled, "Soundproofing," et seq. and Section 16.20.100.

Condition #	Description
	Existing Tenants
13	Tenants at Drill Sites 5 and 7 are existing non-conforming business uses. Existing tenants, Global Solutions, Inc., an office use at Drill Site No. 5, and Platt Security, an auto parking and storage use at Drill Site No. 7, may remain, but may not be expanded, enlarged, or transferred in any way that would increase the nonconformity. The operator shall not rent or lease any part of the Consolidated Drilling Sites for storage, office, or any other businesses or activity not related to oil and gas production or processing.
	Specific Consolidated Drilling and Production Site Conditions
14	The operator shall complete the construction of the following improvements within four (4) months following the approval of the 30-month Conditional Use Permit. All construction and landscaping shall be review and approved by the Director of Community Development and inspected by the Oil Services Coordinator.
14a	Site No. 1 - The operator shall plant three additional trees along the east side of the drill site to improve the public view of the facility.
14b	Site No. 2 - The operator shall remove the dead trees from the Orange Avenue (west) and east sides of the facility. The operator shall remove weeds from the ground-covered areas along Orange Avenue and new ground cover planted as needed. The operator shall plant new trees along the east side of the site. The operator shall design and install a new landscaped area on 29th Street including an automatic irrigation system.
14c	Site No. 3 - The operator shall install new trees and shrubs along the east side of the facility to complement the landscaping proposed for the Town Center North development. The operator shall install an automatic drip irrigation system.
14d	Site No. 4 - The operator shall paint and repair the entry gates on Combellack Drive. Repairs shall include the removal of a pine tree that has overgrown the westerly pilaster, repair and repainting of chipped and cracked pilasters, and repainting of the metal gates to match the original colors. The operator shall remove dead trees from the east and south sides of the facility and repair or construct an automatic irrigation system.
14e	Site No. 5 - The operator shall remove dead trees and shrubs and weeds from the landscaped setbacks along Combellack Drive and Temple Avenue, repair the existing or install a new automatic irrigation system, and plant new shrubs and/or ground cover to present a uniform landscape treatment. The operator shall remove dead trees on the west and south sides of the facility.
14f	Site No. 6 - The operator shall remove weeds from landscaped areas along Grant Street, and plant new trees along the west side of the facility to replace missing trees.
14g	Site No. 7 - The operator shall repair the chain link fence along the west side of the facility and replace broken wood slats. The operator shall remove pallets and debris from the site. The operator shall repair the broken wall near the gate and improve landscaping by adding trees, shrubs and ground cover.
	Gas Processing Facility Construction Related Conditions
15	The operator shall obtain permits and install the gas processing equipment at Site No. 2 within one year of approval of this Conditional Use Permit.
16	After the operator installs the gas processing equipment, the operator shall test the level of noise at the property line generated by the equipment. If the noise level is greater than 70 dB, then the operator shall prepare and submit a Noise Mitigation Plan to the Director of Community Development for review and approval. The plan may include the construction of sound walls or any other method both feasible and reasonable that would reduce the noise level to 70 dB or below at the property line. The operator

Condition #	Description
	shall within three months design and successfully install measures to mitigate noise levels to 70 dB or below.
	Term
17	This permit shall be valid for a period of two years, unless earlier terminated due to a violation of these conditions, or the Signal Hill Municipal Code, or another law or regulation of any entity with appropriate jurisdiction in accordance with Condition 10.
	Resource Study
18	As part of ongoing operations, and during the term of this CUP, the Applicant plans to conduct studies of various parts of the oil reservoir to assist with a more efficient recovery of oil and gas. In an effort to help the City better understand oil operations, an oil and gas consultant hired by the City, and mutually agreed upon by both parties, may periodically review said studies conducted by Applicant. The consultant shall be required to sign a confidentiality agreement with Applicant prior to commencing this review work and any interpretations, results, conclusions or other information related to the Applicant's operations and/or studies documented by the consultant shall be forwarded to Applicant in their entirety and shall be subject to the limitations of said confidentiality agreement.
	Gas Turbine Power Plant Construction and Operation
19	Within two months after the operator completes the construction of the gas turbine power plant at 1215 29th Street, West Unit Processing Facility, the applicant's acoustical engineer shall test and document the level of noise generated by the operation of power plant at the surrounding property lines of the facility. If the noise level exceeds 70 dB at the property lines, the acoustical engineer shall prepare a Noise Mitigation Plan for review and approval by the Director of Community Development. The plan may include the construction of sound walls or any other feasible noise mitigation measures both feasible and reasonable that would reduce the noise level to 70 dB. The operator shall within three months following the approval of the Noise Mitigation Plan design and install any noise mitigation deemed necessary by the plan to comply with this condition.
20	The emissions stack shall be painted a neutral color before operation of the plant subject to the approval of the Director of Community Development and Oil Services Coordinator.
21	The power plant shall operate in compliance with all South Coast Air Quality Management District rules and regulations applicable to the facility.
22	The applicant shall, before operation of the power plant, repair and restore the landscaping surrounding the West Unit Processing Facility subject to the approval of the Director of Community Development and inspection by the Oil Services Coordinator.
23	<p>The operator agrees to continue to cooperate with the City's efforts to establish an electrical utility including:</p> <ul style="list-style-type: none"> • The operator shall contribute 50% of the cost to hire a consultant to prepare an electric utility study to evaluate the feasibility of establishing a City electric utility. • The operator shall cooperate and share facilities and related equipment within the West Unit Processing Facility as a possible location for a City gas turbine power plant, or provide similar support for a City power plant located on an alternative site adjacent to the West Unit Processing Facility as shown on the site plan attached to the related environmental documents. • The operator shall cooperate with the City and share other related equipment of operator, including, but not limited to operator's electrical distribution system, to assist in the operation of a municipal electric utility.
	Landscape Maintenance and Upgrade

Condition #	Description
24	The operator shall install and maintain landscaping at all seven drill sites to the satisfaction of the Planning Commission, improving on the specifications of condition number 14 from the previous conditions of approval for CUP 97-03.
25	The operator shall install the landscaping no later than January 24, 2014 and maintain it to the satisfaction of the Planning Commission. Landscape maintenance is part of the annual review for CUP 97-03.

2.2 Project Location

The Project is located entirely within the boundaries of the City of Signal Hill in Los Angeles County. The drill sites are located within developed urban areas, adjacent to lands developed for industrial, commercial, and residential uses, as shown in Figure 2.2-1. Table 2.2-1 provides the specific assessor's parcel number, general plan designation and zoning designation of each site. The wells within each drill site produce oil and gas from the West, Central, and East units of the Long Beach Oil Field.

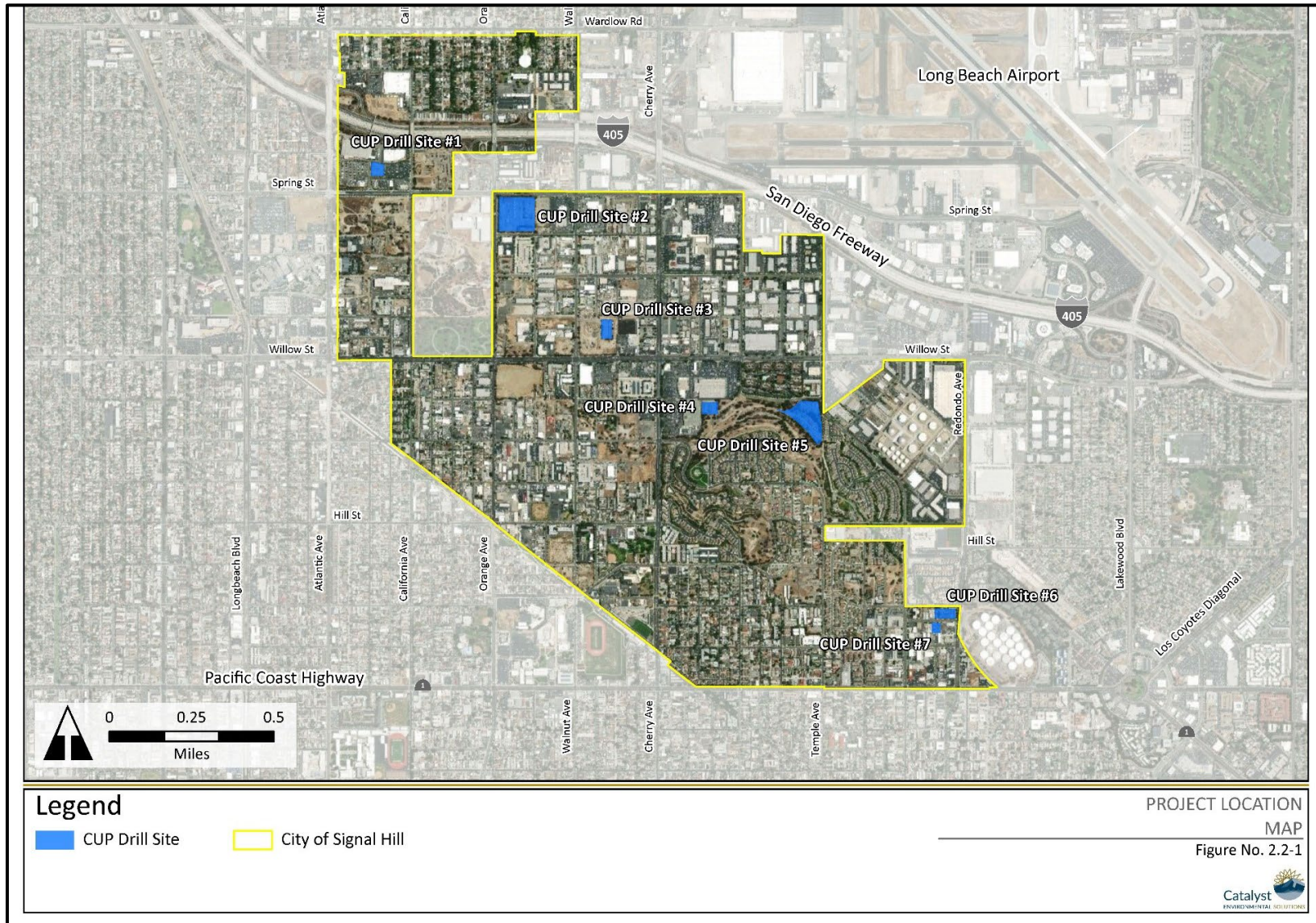


Figure 2.2-1: Location of the Seven Drill Sites within the City of Signal Hill

Table 2.2-1: Drill Site Parcel Number and Land Use Designation

Drill Site	Size (acres)	Address	Parcel Number	General Plan Designation	Zoning Designation	Facilities
West Unit						
Drill Site #1	0.94	805 E. Spring Street, Signal Hill Located in the Gateway Center parking lot, north of Spring Street between California and Atlantic Avenues	7207-024-037	Commercial General (3.2)	Commercial Corridor Specific Plan (SP-6)	Seven water injection wells (3 idle and 4 active) and four production wells (1 idle and 3 active) within an existing well cellar. Ancillary support structures/facilities: electrical panels, pipeline manifolds, test header.
Drill Site #2	8.76	1215 E. 29th Street, Signal Hill Located south of E. Spring Street, east of Orange Avenue, and north of E. 29th Street	7212-008-104	Commercial General (3.2) General Industrial (4.2)	Commercial Corridor Specific Plan (SP-6)	Natural gas processing facility, nine water injector wells (1 idle and 8 active), eight production wells (4 idle and 4 active), natural gas power turbine, electrical substation, water injection plant, oil processing and storage tanks, and other Ancillary structures/facilities: employee changing room, office.
			7212-008-105	General Industrial (4.2)	General Industrial (GI)	
Drill Site #3	1.65	2690 Walnut Avenue, Signal Hill Located northeast of the intersection of Walnut Avenue and E. Willow Street.	7212-011-034	Town Center (3.1)	Commercial Corridor Specific Plan (SP-6)	Seven water injector wells (2 idle and 5 active), seven production wells (3 idle and 4 active), and 10 vacant well slots that have yet to be developed.
Central Unit						
Drill Site #4	1.23	2700 Combellack Drive, Signal Hill Located southwest of Junipero Avenue and	7214-007-032	Town Center (3.1)	Town Center Specific Plan (SP-1)	Four water injector wells (2 idle and 2 active), eight active production wells (no idle wells), and three vacant well slots that have yet to be developed.

Drill Site	Size (acres)	Address	Parcel Number	General Plan Designation	Zoning Designation	Facilities
		Combella Drive behind Home Depot				Ancillary structures/facilities: electrical panel, pipe manifold.
Drill Site #5	7.35	2700 Combella Drive, Signal Hill Located south of Combella Drive, west of Temple Ave, and north of E. Panorama Drive	7214-010-006	Low Density Residential (1.1)	Planned Develop District-2 (PD-2) Hilltop Area Specific Plan (SP-2)	Central processing facilities which include a fluid dehydration plant, a water injection plant, oil and gas shipping equipment, and a Southern California Edison electrical substation; a modular office and a water injection plant; three water injectors (1 idle and 2 active), six production wells (5 idle and 1 active), and six well slots that have yet to be developed. Ancillary structures: natural gas tank, a diesel tank, pipe manifold/electrical panel.
			7214-011-013	Low Density Residential (1.1)	Planned Develop District-2 (PD-2) Hilltop Area Specific Plan (SP-2)	
East Unit						
Drill Site #6	1.07	3365 Grant Street, Signal Hill Bounded by E. Grant Street to the south, Redondo Avenue to the east, and 20th Street to the north	7217-019-009	Light Industrial (4.1)	Light Industrial (LI)	Inactive fluid dehydration plant, a water injection plant, oil and gas shipping equipment, and a Southern California Edison electrical substation, one reinforced block building used as a field office and electrical control room, and two active production wells.
Drill Site #7	0.59	3290 Grant Street, Signal Hill Located south of E. Grant Street	7217-020-005	Light Industrial (4.1)	Light Industrial (LI)	One active oil production well, a test substation, and various pipe manifolds.
			7217-020-006	Light Industrial (4.1)	Light Industrial (LI)	

2.3 Drill Site Descriptions

2.3.1 Drill Site #1

CUP Site #1 is an approximately 0.94-acre site located within the central portion of the Gateway Retail Center parking lot. Drill Site #1 would continue to be used for the recovery of petroleum hydrocarbons through the continued operation of production and drilling facilities, and serve as a gathering site for oil, gas, and water production and a distribution site for water injection. No buildings are located onsite. Existing structures and facilities include seven water injection wells (three idle, and four active) and four production wells (one idle, and three active) within an existing well cellar, as well as ancillary support structures/facilities (i.e., electrical panels, pipeline manifolds, test header). The site is surrounded by an existing block wall and landscape screening has been installed around the entire perimeter, with three access points and locking gates. Figure 2.3-1 shows the layout of Drill Site #1 and the existing structures onsite.

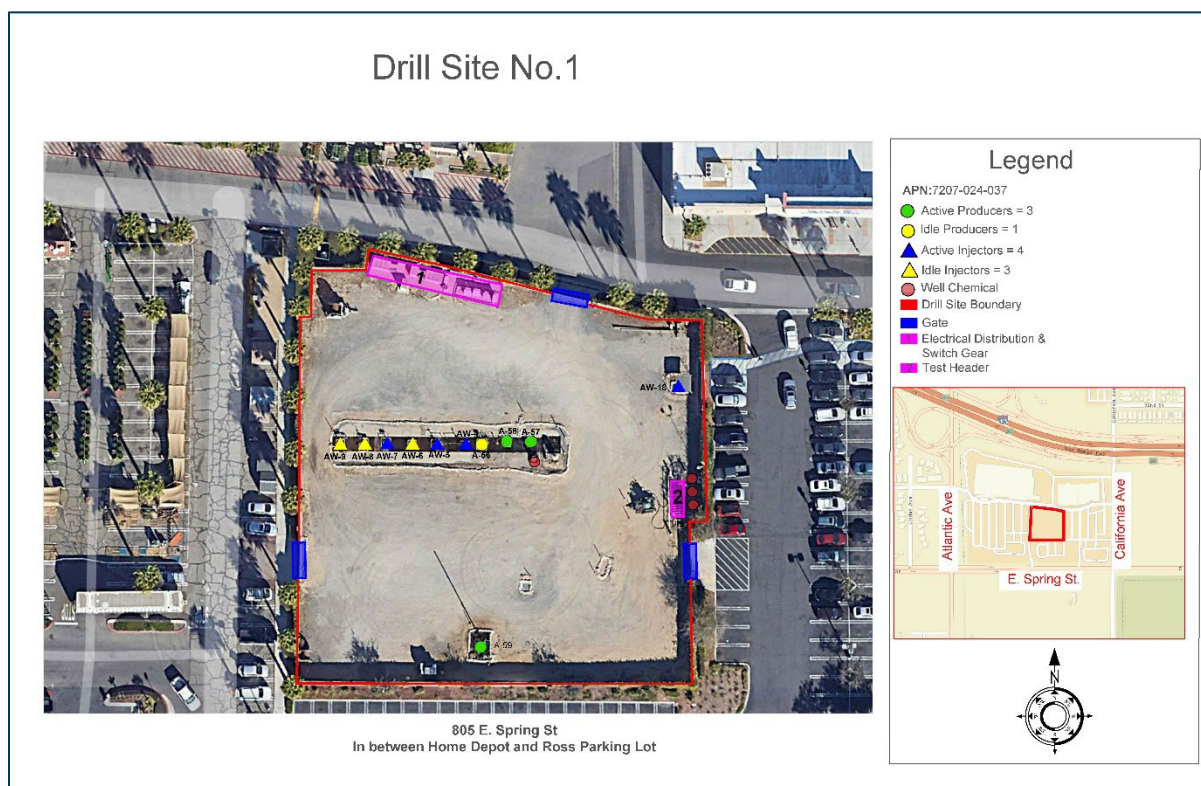


Figure 2.3-1: Drill Site #1

2.3.2 Drill Site #2

Drill Site #2 is an approximately 8.76-acre site located south of E. Spring Street, east of Orange Avenue, and north of E. 29th Street. The site is both a well/extraction site and central processing facility. The existing gas processing facility and power plant/turbine are also located at Drill Site #2. Primary existing structures/facilities include the 7,000-square-foot natural gas

processing facility, which extracts and stores natural gas using various processes (scrubbers, compressors, Low Temperature Separation [LTS] Unit, surge vessels, glycol heater, etc.). In addition to the natural gas processing facility, Drill Site #2 also includes nine water injector wells (one idle and eight active) and eight production wells (four idle and four active), as well as the natural gas power turbine, electrical substation, water injection plant, oil processing and storage tanks, and other ancillary structures/facilities (i.e., employee changing room, office). There are three locked/gated access points which connect to E. 29th Street along the southern perimeter of the site.

The Project includes modifications to the existing gas system, specifically installation of a redundant LTS system to ensure greater operational flexibility and safety. In addition, SHP permitted a natural gas flare at Drill Site #2 in 2022, which is not currently operational, but would begin operating in 2024 and continue operating for the duration of the CUP extension. The Cimarron-certified ultra-low emissions “CEB 800” burner uses proprietary technology for ultra-low emission combustion of waste gas streams (99.9% volatile organic compound [VOC] destruction). Figure 2.3-2 shows the layout of Drill Site #2 and the existing structures onsite, as well as the proposed gas system modification structures (highlighted pink [Map ID #19 and 20]). Table 2.3-1 provides a summary of existing and proposed stationary equipment and tanks, including associated storage capacities.

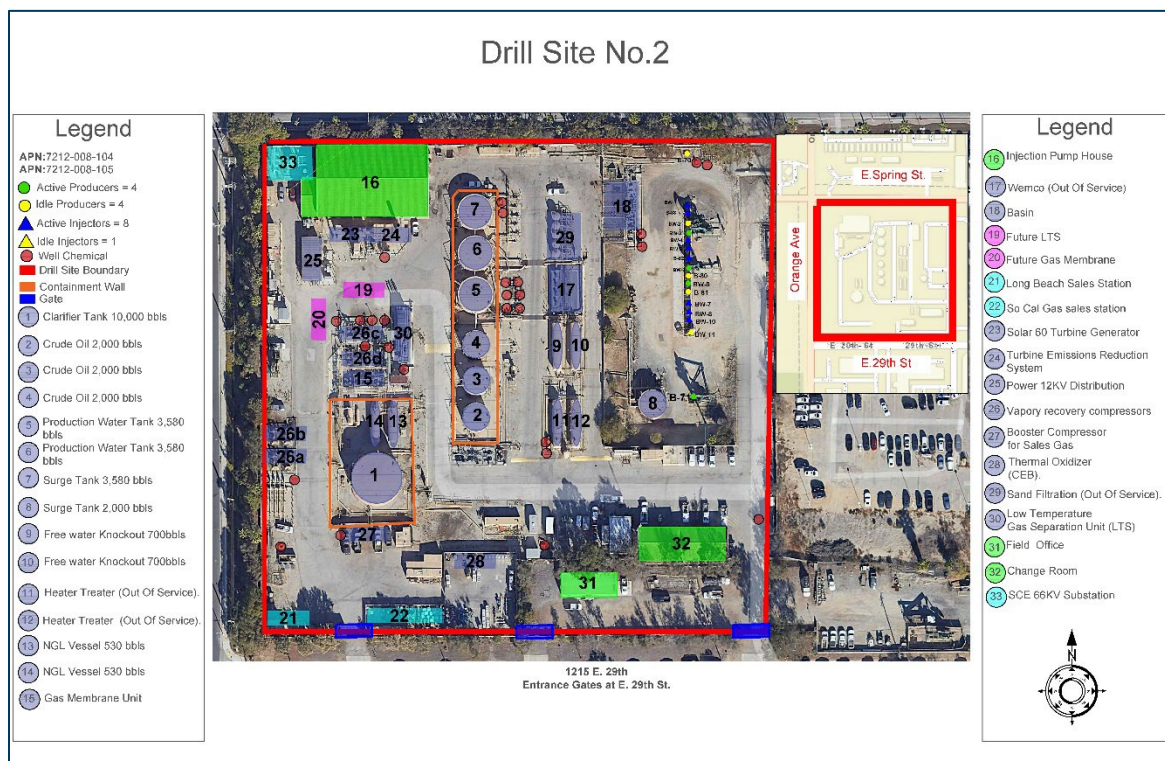


Figure 2.3-2: Drill Site #2

Table 2.3-1: Drill Site #2 Stationary Equipment/Tank Summary

Map ID #	Equipment Description	Storage Capacity (barrels [bbls])
Existing Equipment		
1	Clarifier Tank	10,000 bbls
2	Crude Oil Tank	2,000 bbls
3	Crude Oil Tank	2,000 bbls
4	Crude Oil Tank	2,000 bbls
5	Production Water Tank	3,580 bbls
6	Production Water Tank	3,580 bbls
7	Surge Tank	3,580 bbls
8	Surge Tank	2,000 bbls
9	Free-Water Knockout Unit	700 bbls
10	Free-Water Knockout Unit	700 bbls
11	Heater Treater Units (OUT OF SERVICE)	N/A
12	Heater Treater Units (OUT OF SERVICE)	N/A
13	Natural Gas (NGL) Vessel	530 bbls
14	Natural Gas (NGL) Vessel	530 bbls
15	Gas Membrane Unit	N/A
16	Injection Pump House	N/A
17	Wemco Oil-Water Separator System (OUT OF SERVICE)	N/A
18	Basin	N/A
21	Long Beach Sales Station (Natural Gas)	N/A
22	Southern California Gas Sales Station (Natural Gas)	N/A
23	Solar 60 Turbine Generator	N/A
24	Turbine Emissions Reduction System	N/A
25	Power 12KV Distribution	N/A
26	Vapory Recovery Compressors	N/A
27	So. Cal Gas Booster Compressor	N/A
28	Thermal Oxidizer (CEB)	N/A
29	Sand Filtration (OUT OF SERVICE)	N/A
30	Low Temperature Gas Separation Unit (LTS)	N/A
31	Field Supervisor Office	N/A
32	Employee Changing Room	N/A
33	Southern California Edison (SCE) 66KV Substation	N/A

Map ID #	Equipment Description	Storage Capacity (barrels [bbls])
Proposed Equipment that Would be Installed under the Project (i.e., gas system modification)		
19	Low Temperature Separation (LTS)	N/A
20	Gas Membrane Unit	N/A

2.3.3 Drill Site #3

Drill Site #3 is an approximately 1.65-acre site located northeast of the intersection of Walnut Avenue and E. Willow Street. Drill Site #3 is used for the recovery of petroleum hydrocarbons through the continued operation of production and drilling facilities, and serves as a gathering site for oil, gas, and water production and a distribution site for water injection. No buildings are located onsite. Existing structures and facilities include seven water injector wells (two idle and five active), seven production wells (three idle and four active), as well as 10 vacant well slots that have yet to be developed. There are three access points located along the western and eastern boundary of the site. The entire perimeter of the site is fenced and screened with landscaping, and the entrances are gated/locked as needed to prevent public access. Figure 2.3-3 shows the layout of Drill Site #3 and the existing structures onsite.

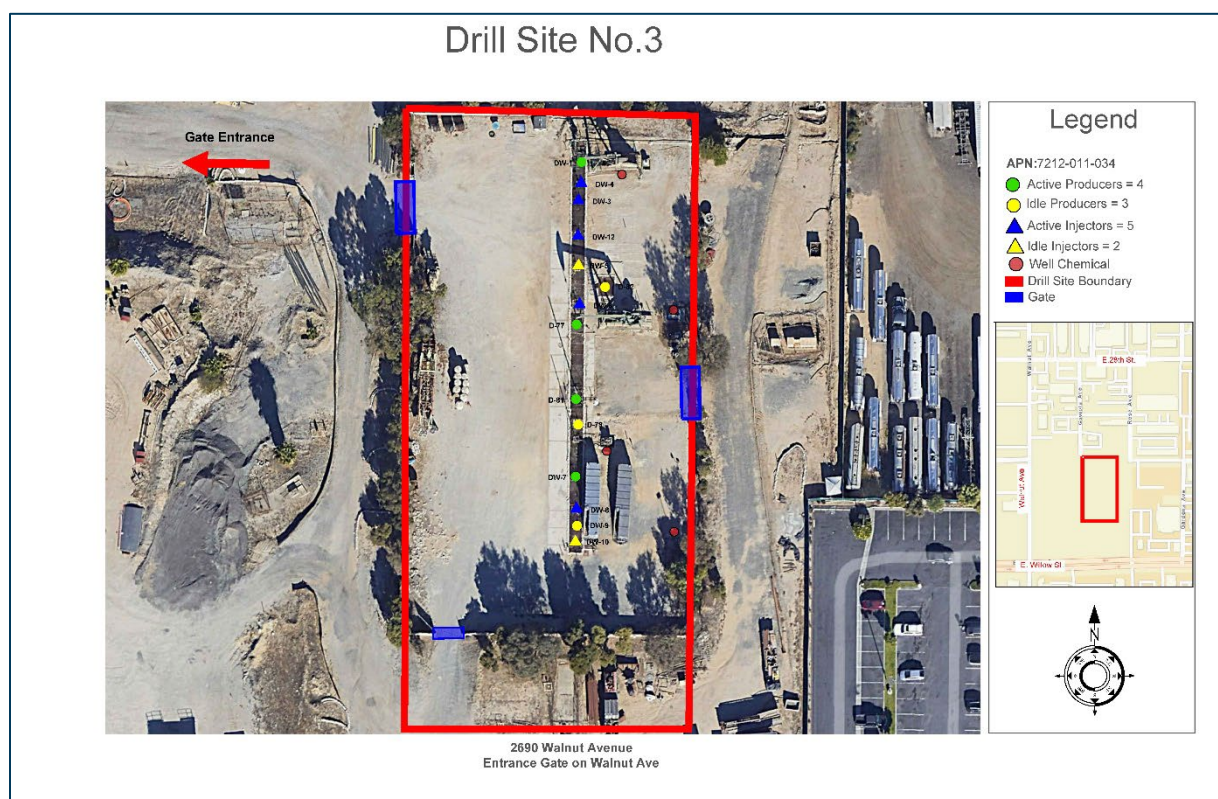


Figure 2.3-3: Drill Site #3

2.3.4 Drill Site #4

Drill Site #4 is an approximately 1.23-acre site located at the southern end of Junipero Avenue. The site is comprised of one parcel tucked behind two large warehouse buildings (Home Depot and Costco Wholesale developed on SHP-owned property) to the north of Panorama Drive.

Drill Site #4 would continue to be used for the recovery of petroleum hydrocarbons through the continued operation of production and drilling facilities, and serve as a gathering site for oil, gas, and water production and a distribution site for water injection. No buildings are located onsite. Existing structures include four water injector wells (two idle and two active), eight active production wells (no idle wells), three vacant well slots that have yet to be developed, as well as ancillary structures/facilities (i.e., electrical panel, pipe manifold). Existing access points are located east of the site connecting to Juniper Avenue/Combella Drive, and north of the site behind Costco. The entire perimeter of the site is fenced and screened with landscaping, and the entrance is gated/locked as needed to prevent public access. Figure 2.3-4 shows the layout of Drill Site #4 and the existing structures onsite.

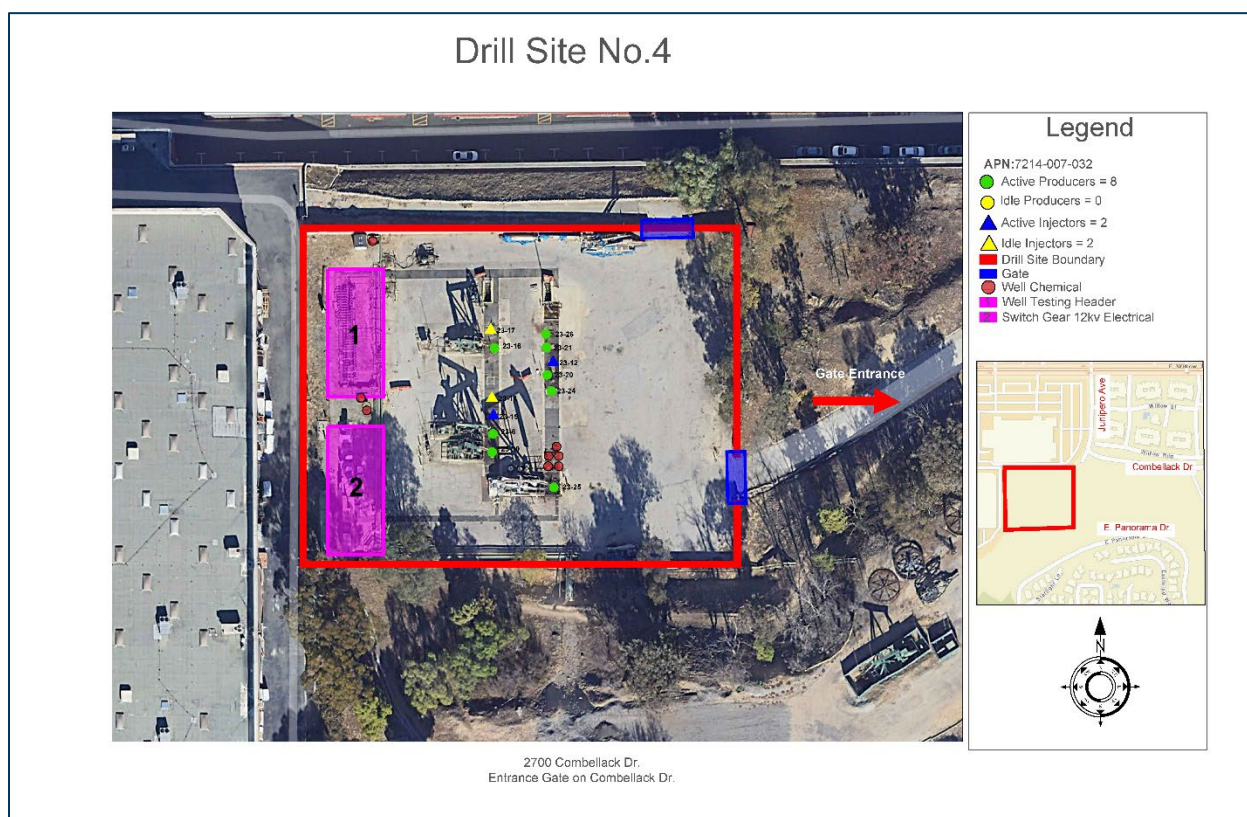


Figure 2.3-4: Drill Site #4

2.3.5 Drill Site #5

Drill Site #5 is an approximately 7.35-acre site located south of Combella Drive, west of Temple Avenue, and north of E. Panorama Drive. Residential neighborhoods (developed on

SHP-owned property) are located on top of the hillside to the south of site, and immediately to the east.

The main components of Drill Site #5 are the central processing facilities, which include a fluid dehydration plant, a water injection plant, oil and gas shipping equipment, and a Southern California Edison electrical substation. Drill Site #5 also serves as the central processing and storage facility for SHP’s broader East Unit operations. Table 2.3-2 provides a summary of the existing stationary equipment and tanks, including associated storage capacities, located at Drill Site #5. No new equipment or expanded storage capacity is proposed at Drill Site #5.

Drill Site #5 also serves as a site for oil, gas, and water production, a distribution site for water injection, and a control center for electrical systems. The site has two buildings: a modular office, and a water injection plant (reinforced block). The site also contains three water injectors (one idle and two active), six production wells (five idle and one active), six well slots that have yet to be developed, and other ancillary structures (e.g., natural gas tank, a diesel tank, pipe manifold/electrical panel, etc.). Site access is provided by a paved road that connects to Combella Drive at the northwest corner of the property. Figure 2.3-5 shows the layout of CUP Site #5 and the existing structures onsite.

Table 2.3-2: Drill Site #5 Stationary Equipment/Tank Summary

Map ID #	Equipment Description	Storage Capacity (barrels)
1	Crude Oil Tank	5,000 bbls
2	Crude Oil Tank	5,000 bbls
3	Wash Tank – Crude Oil Brine Water	5,000 bbls
4	Raw Blend Tank – Brine Water	5,000 bbls
5	Brine Water Tank	3,000 bbls
6	Skim Tank – Crude Oil	3,000 bbls
7	Clean Brine Tank – Brine Water	5,000 bbls
8	Filter Wash Tank – Brine Water	3,000 bbls
9	Overflow Tank – Crude Oil	7,200 bbls
10	Diesel Tanks (x2)	32 bbls each (1,000 gallons each)
11	Free Water Knockouts (Oil/Water/Gas)	795 bbls
12	Free Water Knockouts (Oil/Water/Gas)	795 bbls
13	Free Water Knockouts (Oil/Water/Gas)	800 bbls
14	Injection Pump House	N/A
15	Field Office	N/A
16	SCE 66KV Substation	N/A
17	12KV Switch Gear	N/A

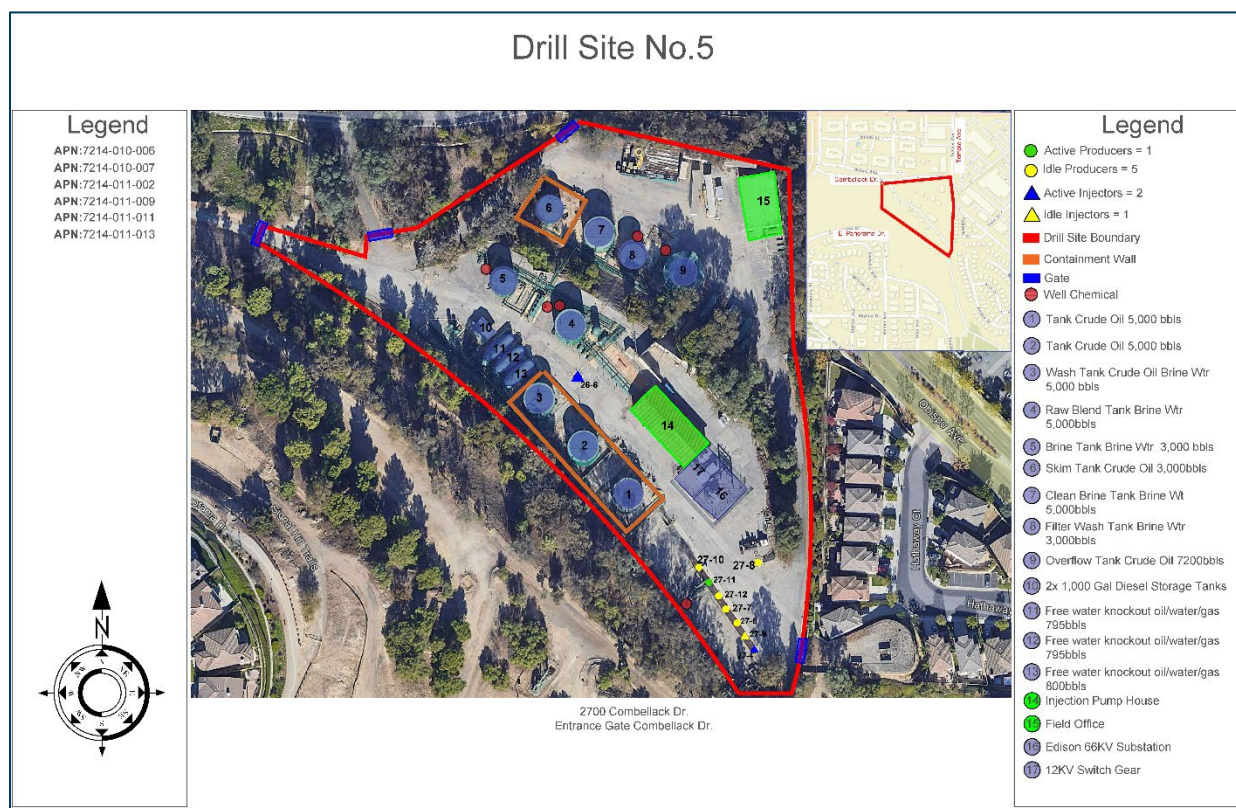


Figure 2.3-5: Drill Site #5

2.3.6 Drill Site #6

Drill Site #6 is bounded by E. Grant Street to the south, Redondo Avenue to the east, and 20th Street to the north. Site #6 is an inactive facility that is used as a locker room for SHP field employees. The site historically served as a central water plant for the East Unit. The main site components include inactive tanks and fluid dehydration plant, inactive water injection plant, inactive oil and gas shipping equipment, and a Southern California Edison electrical substation. The site also has one reinforced block building used as a field office and electrical control room, and two active production wells. In addition, in September 2021, SHP submitted a Notice of Intent to CalGEM to drill one additional well at the site, which is still pending review by the State. Table 2.3-3 provides a summary of the existing stationary equipment and tanks, including associated storage capacities, located at Drill Site #6. No new equipment or expanded storage capacity is currently proposed at Drill Site #6 as part of the Project; however, SHP may elect to bring the site back online, if needed, during the CUP permit period. If SHP were to elect to reactivate the site, it would require stationary equipment and tanks to meet current safety regulations. Reactivation of the site would not result in an increase in production or storage volumes but would provide back-up capability as needed. As these activities are currently speculative, they are not evaluated in this CEQA document and would require site-specific analysis and an amendment to the CUP at such time as they are proposed. The majority of the

perimeter of the site is fenced and screened with landscaping, with two gated/locked access points along E. Grant Street and 20th Street. Figure 2.3-6 shows the layout of Drill Site #6 and the existing structures onsite.

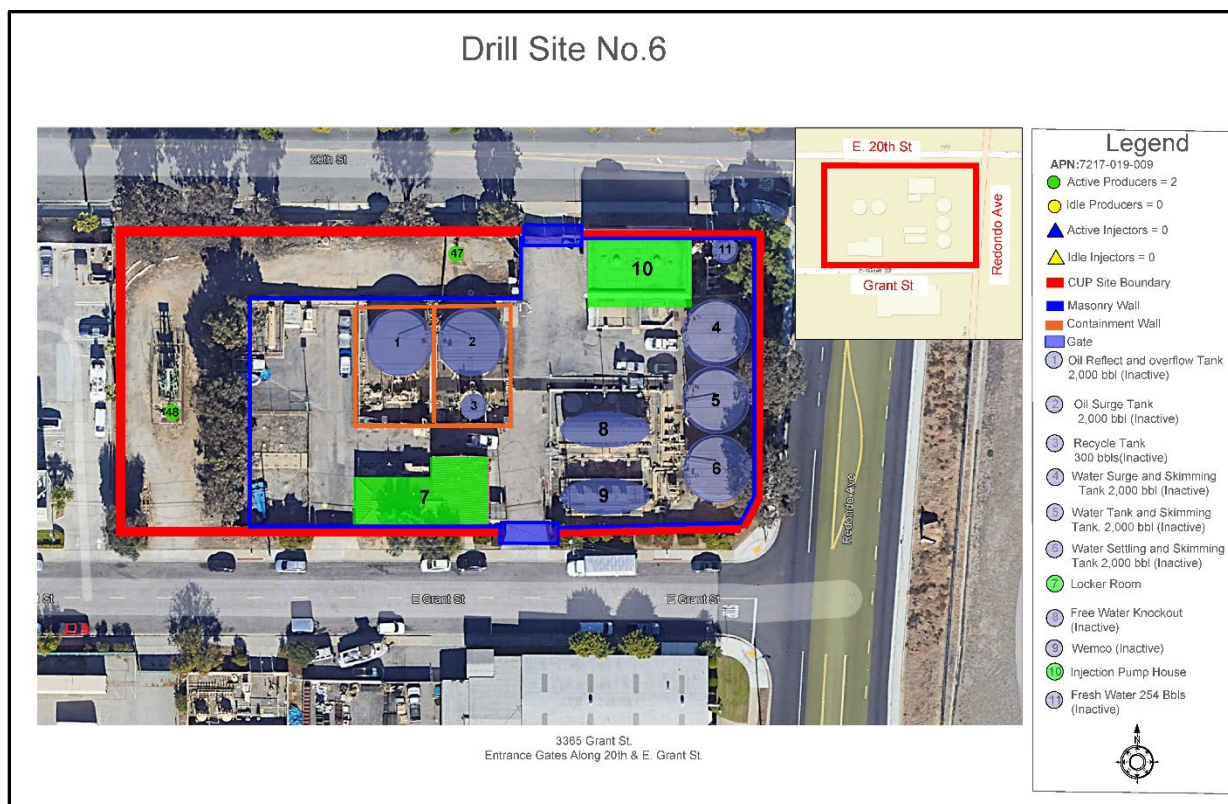


Figure 2.3-6: Drill Site #6

Table 2.3-3: Drill Site #6 Stationary Equipment/Tank Summary

Map ID #	Equipment Description	Storage Capacity (barrels [bbls])
1	Oil Reflect & Overflow Tank (INACTIVE)	2,000 bbls
2	Oil Reflect & Overflow Tank (INACTIVE)	2,000 bbls
3	Recycle Tank	300 bbls
4	Water Surge & Skimming Tank (INACTIVE)	2,000 bbls
5	Water Surge & Skimming Tank (INACTIVE)	2,000 bbls
6	Water Surge & Skimming Tank (INACTIVE)	2,000 bbls
7	Employee Locker Room	N/A
8	Free Water Knockout (INACTIVE)	N/A
9	Wemco Oil-Water Separator System (INACTIVE)	N/A
10	Injection Pump House	N/A
11	Fresh Water Tank (INACTIVE)	254 bbls

2.3.7 Drill Site #7

Drill Site #7 is an approximately 0.59-acre site located south of E. Grant Street. Drill Site #7 is used for the recovery of petroleum hydrocarbons through the continued operation of production and drilling facilities, and serves as a gathering site for oil, gas and water production and a distribution site for water injection. There are no buildings located onsite. Existing structures and facilities include one active oil production well, a test substation, and various pipe manifolds. Access to the site is from E. Grant Street. Figure 2.3-7 shows the layout of Drill Site #7 and the existing structures onsite.



Figure 2.3-7: Drill Site #7

2.4 Project Components

The proposed Project consists of three distinct activities which are described in detail in this section:

1. **Continued Operations** - SHP would continue their existing operations at the current activity level for the duration of the CUP extension in accordance with the conditions of approval in the CUP. The activities consist of continued operations of all existing wells; well servicing and maintenance; redrilling operations on up to 28 existing wells; oil processing, storage and transfer; natural gas and natural gas liquids processing, storage and transfer; produced water separation and injection; and electrical production from a natural gas turbine-powered generator. In addition, SHP obtained a permit for installation of a natural gas flare at Drill Site #2 in 2022. The project is currently under construction and anticipated to be

operational in summer 2024 and would continue operating for the duration of the CUP extension. Each of these activities is described in detail in Section 2.4.1 below.

2. **New Wells and Well Cellars** - SHP proposes to drill up to 46 new wells within the drill sites over the 20-year period. All new wells would be located within the existing drill site boundaries and may be drilled within the existing open slots in the well cellars already present on site or in new well cellars that could be constructed within the existing drill sites. Activities associated with constructing new well cellars and drilling new wells are described in Section 2.4.2 below.
3. **Upgrades to Natural Gas Processing Facility** - SHP proposes to upgrade the natural gas processing facility at Drill Site #2 to facilitate sale of excess natural gas to Southern California Gas Company and promote efficiency and redundancy in operations. The construction activities associated with the proposed upgrades are described in detail in Section 2.4.3.

2.4.1 Continued Operations

The following sections describe existing activities and operations which would continue under the proposed Project.

2.4.1.1 Project Personnel and Hours of Operation

To ensure ongoing operations at the drill sites continue to operate in a safe and secure manner, all seven drill sites would continue to be monitored 24 hours per day, 365 days per year. A total of 12 to 14 employees per day would continue to work at the seven drill sites. Employee vehicular access and parking would continue to be provided by existing access points and designated parking areas. No change from historical activity is proposed or anticipated.

During intermittent redrilling operations, an additional four to eight employees/vendors per day would work at the specific drill site(s) where the activities are occurring. Redrilling operations would continue to occur 24 hours per day when they occur. Other onsite activities/operations would continue to occur during daytime hours only. Table 2.4-1 summarizes the current activities and associated operational hours, along with average vehicle trips and travel distance associated with existing operations which would continue for the duration of the CUP period.

2.4.1.2 Well Servicing and Maintenance

SHP would continue to conduct routine well servicing and maintenance activities at the drill sites, on an as-needed basis, and would continue to prepare and submit an Annual Well Maintenance Report to the City in accordance with CUP requirements. These activities include facility tours, environmental testing, landscape maintenance, well testing, and well bore

cleaning⁴ after redrilling and new drilling operations. Vehicle trips associated with these activities are captured in Table 2.4-1.

⁴ Also termed “stimulation”, well bore cleaning is conducted after a well has been completed, to increase production by improving the flow of hydrocarbons from the reservoir into the well bore. The activity of drilling can often cause debris to block the channels in the rock throughout which the reservoir fluids flow. Cleaning the well bore involves using minimal amounts of formic acid to dissolve the debris within the well bore.

Table 2.4-1: Typical Hours and Days of Operation and Vehicle Trips

Activity ⁶	Description	Vehicle Type	Days per Week	Hours per Day	Roundtrips (inbound + outbound ⁸)	One-Way Trips	Avg. Roundtrip Distance (Miles)	Daily VMT
Operations Surveillance ^{1, 2}	Routine site visits to ensure equipment is operating properly/check for leaks.	Light-Duty	Monday–Sunday	24 hours/day	2	4	7	14
Plant Operations ^{1, 3}	Continual monitoring of equipment and processes to ensure safety.	Light-Duty	Monday–Sunday	24 hours/day	2	4	5	10
Surface Equipment Maintenance & Repairs ^{1, 7}	Maintenance crew or mechanic for repairs and scheduled maintenance.	Light-Duty	Monday–Friday	7:00 a.m. – 7:00 p.m.	6	12	7	42
Down Hole Well Servicing ^{1, 7}	Well servicing rig and ancillary equipment as required.	Light-Duty	Monday–Friday	7:00 a.m. – 7:00 p.m.	2	4	6.5	13
Drilling/Redrilling Operations ^{4, 7}	Drilling rig, crews and miscellaneous equipment as required.	Light-Duty	Monday–Sunday	24 hours/day	8	16	5	40
Misc. Vendor / Contractor Maintenance & Site Visitors ^{1, 7}	Chemical shot trucks, vacuum trucks, well test equipment, landscape maintenance crews, third-party environmental testing technicians, regulatory inspectors, City or public facility tours, etc.	Light-Duty	Monday–Friday	7:00 a.m. – 7:00 p.m.	2	4	7	14
Materials / Equipment Delivery & Removal ⁵	Pipe tripping, truck deliveries, etc. (except emergencies)	Heavy-Duty	Monday–Friday Saturday	7:00 a.m. – 7:00 p.m. 7:00 a.m. – 5:00 p.m.	8	16	5	40
				Existing Daily Vehicle Trips:	30	60	Existing Daily VMT:	173

Table Notes:

1. A total of twelve (12) to fourteen (14) employees per day currently work at and travel between the seven (7) CUP sites during the course of normal operations. These existing employees and associated vehicle trips are collectively represented by the existing daily, light-duty vehicle activity (14 roundtrips total) shown above.
2. Represents two (2) well tester vehicles moving between the seven (7) CUP sites each day (total roundtrip distance from start to finish is approx. 7 miles).
3. Represents two (2) plant operators/vehicles working in two (2), 12-hour shifts at the plant facilities (average roundtrip distance from SHP office to/from plant facilities [primarily CUP Site #2] is approx. 5 miles).
4. Redrilling activity would not occur on a typical operational day. However, on intermittent days when redrilling is occurring, eight (8) additional employee/contractor vehicles would travel from SHP's office to the farthest CUP Site (i.e., roundtrip distance to CUP Sites #6 and #7 is approx. 5 miles) to conduct these operations.
5. Although heavy-duty truck activity would be infrequent, it's assumed four (4) heavy-duty trucks would travel to/from the CUP sites on a given day. These trips represent tanker trucks, larger material deliveries, equipment/drill rig transports, etc.
6. Trips represent automobile and light-duty trucks for all activities, except "Materials/Equipment Delivery & Removal" which represents heavy-duty truck activity.
7. Daily trips for "Surface Equipment Maintenance & Repairs", "Down Hole Well Servicing", "Redrilling Operations" and "Misc. Maintenance & Site Visitors" include contractors/vendors as well as SHP employees.
8. For the purpose of circulation impacts, a Passenger Car Equivalence (PCE) Factor of two is applied to heavy duty trucks per Federal Highway Administration (FHWA) guidance (<https://www.fhwa.dot.gov/reports/tswstudy/Vol3-Chapter9.pdf>), which states "On level terrain and in uncongested conditions conventional trucks may be equivalent to about **two** passenger cars in terms of their impact on traffic flow." Although application of a PCE is more appropriate for the assessment of a project's impact on the level of service of impacted roadways, the VMT calculation herein also incorporates the PCE factor for heavy-duty trucks in order to simplify the analysis while also providing a more conservative estimate of VMT associated with the Project.

2.4.1.3 Redrilling of Existing Wells

SHP would continue to redrill production and injection wells on an intermittent, as-needed basis, at the drill sites. Redrilling existing wells requires a permit from CalGEM, inspections by the Oil Services Coordinator as well as City permits. As part of the Project, SHP proposes to continue redrilling activities to as many as 28 existing wells over the proposed 20-year period within the footprint of the drill sites. Downhole redrilling activities include reperforating the well at different depths, sidetracking, deepening and reworking operations. The activity levels associated with redrilling, as well as the equipment and processes utilized, would not change, and SHP would continue these operations in the same manner as they have historically, including the use of drilling fluids (“drilling mud”). The redrilling procedures for production and injection wells are essentially the same. Table 2.4-2 summarizes the number of existing wells that were redrilled annually between 2009 and 2019. Based on this historic data, the annual average number of existing wells that required redrilling in any given year is one and the maximum number of existing wells that were redrilled in a given year was six. For this Project, SHP would not exceed the annual maximum number of redrilling operations (6) in any given year over the 20-year continued operation period. This limit (maximum 28 total redrill operations, and maximum six in any single calendar year) would be made a condition of approval of the CUP.

Table 2.4-2: Summary of the Number of New Wells Drilled and Existing Wells Redrilled Annually at Drill Sites between 2009 and 2021

Year	Number of New Wells Drilled	Number of Existing Wells Redrilled	Total Wells Requiring Downhole Rig Work	Rig Use
2009	2	0	2	All Rig #5 (Diesel)
2010	2	1	3	All Rig #5 (Diesel)
2011	1	3	4	All Rig #5 (Diesel)
2012	2	4	6	Rig #5 (Diesel) – 5 wells Rig #6 (Electric) – 1 well
2013	3	0	3	All Rig #6 (Electric)
2014	2	1	3	All Rig #6 (Electric)
2015	0	0	0	Not used
2016	0	0	0	Not used
2017	0	0	0	Not used
2018	0	0	0	Not used
2019	0	1	1	All Rig #6 (Electric)
2020	0	0	0	Not used
2021	0	0	0	Not used

Well servicing activities for a single well at a given drill site are generally completed within a single week. SHP uses two rigs for their drilling and re-drilling operations, depending on the depth to be drilled. The lighter-duty drilling rig is SHP's Rig #5. This rig has a 2008 Cameron/Hubbard C-500 draw-works and mast powered by a 450 horsepower (hp) U.S. Environmental Protection Agency (USEPA) Tier 4 clean burn engine. The remainder of Rig #5's equipment is electrically powered. Rig #5 is typically used for shallower wells (7,000-feet below ground surface [bgs] or less) and re-drills on smaller well sites. SHP's Rig #6 is a heavier-duty drilling rig with a 1,000 hp electrically powered draw-works motor. All of Rig #6's equipment is electrically powered (i.e., no fuel consumed during drilling/re-drilling operations). For electric power, SHP's drilling rigs are designed to plug directly into SHP's private electrical distribution system and do not require electricity service from outside utility providers. As shown in the table above, since 2012 SHP has exclusively used its electric rig for all drilling and re-drilling activities within the CUP site boundaries. However, to provide for some operational flexibility, SHP proposes to use Rig #5 approximately 10% of the time and Rig #6 approximately 90% of the time.⁵ The following list summarizes the specific equipment utilized during the re-drilling process:

- Drilling mast and drawworks (used all days);
- Circulating pumps (mud pumps (used all days – all electric));
- Mud tanks, cleaners, etc. (all electric);
- Drill pipe;
- Backhoe (average 4-hours per drilling day - diesel);
- Crane trucks (average 8-hour days per well - diesel)
- Downhole specialty well logging truck (18-hours per well - diesel);
- Ancillary casing and logging tools (used during logging only – electric);
- Well servicing/completion rig (used after drilling/re-drilling to equip a well with downhole production equipment, on average five, 10-hour days per well - diesel); and
- Vacuum truck (average 4-hours per drilling day - diesel).

2.4.1.4 Oil Processing, Storage and Transfer

Of the seven drill sites, four (Drill Sites #1, #3, #4 and #7) are primarily used to extract oil, gas, and other byproducts (e.g., produced water) which are then transported via an existing network of pipes to the central processing facilities, located at Drill Site #2 and Drill Site #5 which contain the processing and storage tanks within the West, Central, and East units. Drill

⁵ The analysis in this Draft EIR is based on SHP's proposal to use Rig #5 10% of the time and Rig #6 90% of the time for the duration of the 20 year CUP period. If approved, SHP's proposed limit on use of Rig #5 would be made a condition of approval of the CUP.

Site #2 also houses the natural gas processing and electric power generation facilities. Drill Site #6 was historically the central water processing facility for the East Unit; however, as described in Section 2.3.6, the site is currently inactive, and oil, water, and natural gas extracted from the East Unit is currently routed to either Drill Site #2 or #5 for processing. Drill Site #6 contains processing and tank storage facilities that are idle, but available as backup to Drill Site #5, and also has two active production wells onsite. The central processing facilities (Drill Site #2 and #5) also have active production and injection wells onsite. Once oil is processed at the central processing facilities, it is transferred to existing pipes operated by Crimson Pipeline that are located on Drill Sites #2 and #5 which transfer the oil to refineries located in Wilmington or Long Beach.

A list of facilities present at each drill site is provided above in Table 2.2-1 and described in more detail in Section 2.3.

2.4.1.5 Soils Management

The following maintenance activities at the drill sites would continue under the Project. These activities generate soils that are moved to SHP's South Cell staging area located off California Ave. before final disposal:

- Existing well cellars are cleaned out annually, which produces approximately 250 to 500 cubic yards of soil per year;
- Tanks at CUP Sites #2 and #5 are cleaned out biannually, which produces approximately 8,000 cubic yards of tank bottom materials every other year; and
- Daily operations such as well works, and well maintenance produces approximately 100 cubic yards of drilling muds per year.

SHP follows SCAQMD Rule 1166 soil monitoring protocols during excavation of all material at the CUP sites. A calibrated photoionization detection meter (PID) is kept on site during all excavation work. Dry material soil (after initial screening by the PID to ensure that volatile organic compound (VOC) levels are below Rule 1166 thresholds, i.e., not volatile), is transported via dump truck or roll-off bin to the California Ave. staging area; the stockpile staging area at the California Ave. site is fully lined and located away from concentrated flows, drains, or inlets. Once the soil is at the California Ave. staging site, it is sampled and analyzed by a certified third-party laboratory. If the third-party testing results indicate the material meets the criteria for “clean fill”, it is moved to the California Ave. staging site in the designated location for clean fill and is able to be used as fill material at other properties. If the third-party testing results indicate that the material does not meet the criteria for “clean fill”, the soil is taken by dump truck to an approved landfill that accepts such material.

If the materials consist of wet solids collected by a vacuum tank truck, it is transported to the California Ave. staging area and placed in steel tanks to decant the liquids. After separation, a

vacuum truck skims the bins and removes the free water and sometimes oil. The liquids are transported via vacuum tank truck to Drill Sites #2 or #5, where they are combined with other produced water in the free-water knockout tank and reused by SHP for production operations in a closed-loop system.

The remaining material in bins is mixed with clean and dry soil material from the California Ave. staging area until it solidifies. Once solidified, the material is moved out of the steel tanks to the staging area, and then tested to profile the waste as either clean or contaminated and managed as described above for dry soils.

2.4.1.6 Utilities and Energy Generation and Consumption

Electricity and natural gas are both generated and consumed as part of ongoing operations under CUP 97-03. The existing gas processing and turbine power plants located at Drill Site #2 generate electric power directly, by recycling natural gas produced at SHP's extraction sites. This electricity is then used to power the drill sites and SHP's other offsite operations to the extent feasible, reducing the need to purchase power from offsite producers. Approximately 4.5 to 5 Megawatts (MW) per day (or 70 percent) of the electricity demand for operations is generated onsite, the remainder 1.5 to 2 MW per day is purchased from Southern California Edison. Drill Site #2 generates onsite electricity through the existing natural gas processing plant and the combustion turbine.

The gas plant processes and removes liquids from the gas produced at wells covered under CUP 97-03, in addition to produced gas from other local wells operated by SHP. The processed natural gas is then transferred to the onsite combustion turbine (i.e., power plant) where it is converted into electrical power. Currently, approximately 70 percent of the processed natural gas is consumed directly within the onsite power turbine. The remaining quantity of gas produced is sold through the onsite sales meters and existing delivery pipelines to the City of Long Beach or would be combusted using the flare, in accordance with SCAQMD air quality regulations. In addition, Southern California Gas Company is in the process of installing a sales meter and delivery pipeline on an easement at Drill Site #2, to facilitate transfer of SHP produced gas.

SHP's light-duty vehicles are gasoline-powered and fueled offsite. No change in gasoline fuel use is proposed. SHP's heavy-duty vehicles are powered by diesel. There are two existing permitted aboveground diesel tanks (2,000 gallons total) located at Drill Site #5. No change in diesel fuel use, storage, or handling is proposed.

Project employees and other onsite personnel would continue to utilize existing sewer-connected restrooms at Drill Sites #2, #5, and #6, or other portable bathroom facilities located onsite at the remaining drill sites.

2.4.1.7 Hazardous Materials and Storage

The primary hazardous materials stored and used are corrosion control chemicals. Hazardous materials/production chemicals are used at all drill sites. Table 2.4-3 lists the hazardous materials currently stored at the various drill sites.

These CUP sites maintain Hazardous Materials Business Plans (HMBP), which are updated annually by SHP and reviewed/approved by the Los Angeles County Fire Department (i.e., the Certified Unified Program Agencies [CUPA]). Bulk storage of hazardous materials/production chemicals was recently relocated to Drill Site #7 and a supplemental HMBP was completed and approved by the Los Angeles County Fire Department on October 20, 2022.

SHP also updates their hazardous materials inventories and associated reports annually and on an as-needed basis through the California Environmental Reporting System (CERS). Minimal quantities of hazardous waste are generated as a byproduct of existing oil and gas production processes at Drill Sites #2 and #5. The Project would not result in additional hazardous waste generation, and hazardous waste would continue to be handled and properly disposed of in accordance with local and state requirements (i.e., City, Los Angeles County Fire Department, and state/California Department of Toxic Substances Control).

Table 2.4-3: Hazardous Materials Stored at Drill Sites and Classifications

Material	Drill Site(s)	Department of Transportation Hazard Class ^a	Physical Hazard Class ^b	Health Hazard Class ^c
Ammonia	2	2.2	Corrosive	T, I
Biocide 8407	7	8	-	T, I
Oils / Grease	2	-	Flammable	-
Corr Film A/B	7	3	Flammable Liquid, Class I-C	T, I
Corrtreat 14970	2, 3, 4, 5, 7	8	Combustible Liquid, Class II	C, T, I
Corrtreat 15190	7	3	Flammable Liquid, Class I-A	T, I
Diethanolamine	2	-	-	T, I
D-Limonene	7	3	Flammable Liquid, Class I-C	AH, T, I
Ethylene glycol	2	3	Combustible Liquid, Class III-B	C, T, I
Floctreat 7960	1, 2, 5, 7	-	Combustible Liquid, Class III-B	-
Floctreat 12008	2, 7	-	Combustible Liquid, Class III-B	I
Methanol	2	3	Flammable Liquid, Class I-A	AH, T, I
Methylene Chloride	7	-	-	C, T, I
MT 9403 Scale	5	3	Flammable Liquid, Class I-C	T, I
Multitreat 9403NC	4, 7	-	Combustible Liquid, Class III-B	AH, T, I
Multitreat 9302	2, 5, 7	6.1	Combustible Liquid, Class III-B	T, I
Phasetreat 17756	1, 7	3	Combustible Liquid, Class II	AH, C, T, I
Phasetreat 14224	2, 3, 4	3	Flammable Liquid, Class I-C	AH, T, I
PT 13948 Emulsion	4	3	Flammable Liquid, Class 1-B	T
Scaletreat 1012	3, 4, 7	3	Combustible Liquid, Class III-B	T, I

Material	Drill Site(s)	Department of Transportation Hazard Class ^a	Physical Hazard Class ^b	Health Hazard Class ^c
Scaletreat 402	7	-	Combustible Liquid, Class III-A	I
Scavtreat 6804	1, 2, 4, 7	6.1	-	T, I
Scavtreat 1193	1, 5, 7	3	Combustible Liquid, Class II	AH, T, I
Scavtreat 1092	2, 5, 7	8	Corrosive	T, I
Shell Sol Industrial	2	3	Combustible Liquid, Class II	
Flammable Liquid,	T, I			
Solvtreat 3033	7	8	Combustible Liquid, Class II	T, I
Solvtreat 12086	2, 5, 7	3	Flammable Liquid, Class I-C	AH, T, I
Summit PGS-150	2	3	Combustible Liquid, Class III-B	
Flammable Liquid,	T, I			
Summit NGP-100	2	-	-	I
Turbo T Oil 68	2	-	-	I
Waxtreat 3635T	7	3	Flammable Liquid, Class I-A	AH, C, T, I
Propane Gas	2	2.1	Flammable Gas	SA
Propane Liquid	2	2.1	Flammable Gas	SA, I
Propane R290	2	2.1	Flammable Gas	
Gas Under Pressure	-			
Natural Gas Liquids	2	3	Flammable Liquid, Class I-A	AH, C, T, I
Natural Gas	2, 5	2.1	Flammable Gas	SA, AH, C, T, I
Crude Oil	2, 5	3	Flammable Liquid, Class I-C	AH, C, T, I
Diesel Fuel	5	3	Combustible Liquid, Class II	AH, C, I
Used Oil	2	3	Combustible Liquid, Class III-B	T, I

Source: SHP, 2022b; SHP, 2022c; SHP, 2022d; SHP, 2022e; SHP, 2022f; SHP, 2022g.

- a. Department of Transportation Hazard Classes
 - 2.1 = Flammable gas
 - 2.2 = Non-flammable compressed gas
 - 3 = Flammable and combustible liquid
 - 6.1 = Poisonous materials
 - 8 = Corrosive materials
- b. Physical Hazard Classes – Flash Point, Boiling Point
 - Flammable Liquid Class I-A = <73 °F, < 100°F
 - Flammable Liquid Class I-C = 73-100 °F, N/A
 - Combustible Liquid, Class II = 101-140 °F, N/A
 - Combustible Liquid, Class III-A = 141-199 °F, N/A
 - Combustible Liquid Class III-B = >200 °F, N/A
- c. Health Hazard Classes
 - AH = Aspiration Hazard
 - C = Carcinogenicity
 - Toxicity
 - I = Skin Corrosion Irritant, Eye Damage, Eye Irritant and/or Respiratory Skin Sensitization
 - SA = Simple Asphyxiant
 - T = Acute, Reproductive, and/or Specific Organ

Various production, maintenance and operations chemicals are used at the drill site facilities for routine activities as summarized in Table 2.4-3 above. While the detailed inventory of chemicals and their onsite amount may vary, the chemical categories listed in Tables 2.4-4 (Central and East units) and 2.4-5 (West Unit) are expected to be at the respective facilities at any time during operations. These chemicals are stored on storage pads with secondary containment, within larger contained areas (with berms and/or walls) such as inside aboveground tank batteries, within portable or permanent individual secondary containment cradles, or within

maintenance/supply sheds or curbed areas. Descriptions of existing above-ground storage tanks and contents are included in the drill site descriptions above in Section 2.3. Further description of hazardous materials and wastes is included in Section 3.9, Hazards and Hazardous Materials.

Table 2.4-4: Chemicals Stored at Signal Hill Central (Drill Sites #4 and #5) and East Units (Drill Sites #6 and #7)

Storage Container Type	Container Volume	Chemical Category
Cans & Drums	30 gallons – 200 gallons	Engine & machine oils, e.g., lube oil, gear oil, hydraulic oils, transmission oil
Cans, Drums & Plastic Tanks	55 – 500 gallons	Solvents and degreasers
Drums & Plastic Tanks	55 – 300 gallons	Water clarifiers, flotation aids, demulsifiers, clarifiers
Plastic Tanks	100 – 500 gallons	Bactericides
Drums & Plastic Tanks	55 – 300 gallons	Corrosion inhibitors, scale remover
Drums & Plastic Tanks	55 – 300 gallons	Miscellaneous oil and produced water treatment chemicals & additives

Table 2.4-5: Chemicals Stored at Signal Hill West Unit (Drill Sites #1, #2, and #3)

Storage Container Type	Container Volume	Chemical
Drums	30 gallons – 200 gallons	Engine & machine oils, e.g., lube oil, gear oil, hydraulic oils, transmission oil
Drums & Plastic/Metal Totes	55 – 500 gallons	Solvents and degreasers
Drums & Plastic/Metal Totes	55 – 300 gallons	Corrosion inhibitors, scale remover miscellaneous oil and produced water treatment chemicals & additives

2.4.1.8 Water Demand, Consumption, Disposal

Potable water for operations conducted under CUP 97-03 is provided by the City of Signal Hill. SHP’s current operations consume an average of 9,500 gallons per day on normal operating days, and an additional 2,100 gallons per day when new wells are being drilled (redrilling does not consume additional water resources). The proposed gas system modifications at Drill Site #2 would not increase water use for the Project. No future change in potable water use for operation of the drill sites is proposed as part of the Project.

Water produced by the production wells is 100 percent recycled for secondary recovery/waterflood operations in accordance with SHP’s active Class II Underground Injection Control permit (UIC Project #41206002). SHP’s existing operations under CUP 97-03 produce various quantities of oil, gas and produced water. Table 2.4-6 summarizes applicable average annual production levels for each drill site based upon historical data from 2010 to 2021. Table

2.4-7 summarizes the annual quantity of produced water that is recycled and reinjected using injection wells at the drill sites to enhance oil recovery.

The source of all the water injected by SHP is water produced by other wells (both wells within the drill sites and other wells owned and operated by SHP outside of the drill sites) (CalGEM 2018). In 2022, SHP injected 18,970,284 barrels of water through its active waterflood wells in the Long Beach field, approximately 75 percent was reinjected via wells at the drill sites (CalGEM 2023).

Table 2.4-6: Average Volume of Fluids Produced by SHP Wells at the Drill Sites (Based on data from 2010-2021)

Drill Site	Fluids Produced by SHP Wells by Drill Site		
	Crude Oil (bbls)	Produced Water (bbls)	Natural Gas (mscf)
Drill Site #1	50,412	869,456	28,886
Drill Site #2	24,076	478,981	6,396
Drill Site #3	28,816	210,002	10,309
Drill Site #4	80,296	816,818	28,824
Drill Site #5	3,024	18,747	631
Drill Site #6	14,992	373,213	3,724
Drill Site #7	2,416	166,845	601
Total CUP Annual Average:	204,032	2,934,063	79,371

Source: Sespe Consulting 2022a

Table 2.4-7: Average Annual Volume of Water Reinjected into Producing Formation by Injection Wells at the Drill Sites (Based on data from 2010-2021)

Drill Site	Water Produced from Drill Sites that is Injected at Drill Site (bbls)	Water Produced from Offsite Wells that is Injected at Drill Site (bbls)	Total Volume of Produced Water Injected at Drill Site (bbls)
Drill Site #1	869,456	1,396,542	2,265,998
Drill Site #2	478,981	2,785,211	3,264,192
Drill Site #3	210,002	4,127,778	4,337,781
Drill Site #4	816,818	549,109	1,365,927
Drill Site #5	18,747	1,639,941	1,658,688
Drill Site #6	0	0	0
Drill Site #7	0	0	0
Total CUP Annual Average:	2,394,004	10,498,581	12,892,585

2.4.1.9 Vapor Recovery System and Greenhouse Gas Control Measures

SHP currently maintains a vapor recovery system, which ensures that fugitive emissions, including greenhouse gases (GHGs), are reduced to the extent feasible. The vapor recovery system consists of specially designed pipelines that provide casing vapor recovery for SHP's wells and tank farms that operate within the seven drill sites, by collecting the produced gas by vacuum. The captured vapor is then transferred to Drill Site #2 where it is then dehydrated and processed, and either consumed in the gas turbine or sold to third-party customers. SHP would continue to implement and maintain the vapor recovery at each of the drill sites through the proposed 20-year continued term of CUP 97-03 in order to ensure that GHGs such as carbon dioxide (CO₂) and methane (CH₄) are contained within the vacuum sealed closed system, and not released into the atmosphere as fugitive emissions. Specifically, the following vapor recovery systems/protocols would continue to be implemented at the drill sites:

- **Oxygen Sensors/Monitoring:** Because the vapor recovery system operates under a controlled vacuum, the presence of oxygen within the system is not beneficial and can indicate a mechanical problem or leak. SHP has installed numerous oxygen sensors throughout the vapor recovery system infrastructure which are monitored 24 hours per day, seven days a week so that potential problems can be quickly identified and remedied. The sensors would continue to be tested and calibrated regularly (generally once a week) to ensure the system is functioning properly. If an anomaly is detected, SHP would temporarily shut down operations, sometimes across their entire field, until operations personnel can confirm there are no leaks or pipe failures. In addition to the automatic sensors, operations staff have access to hand-held sensors that are periodically used to spot check portions of the vapor recovery infrastructure. In addition to the automatic sensors, the vapor recovery would continue to be visually inspected a minimum of once daily by SHP operations personnel. Finally, vacuum pressure readings would continue to be monitored at 17 different locations throughout the drill sites a minimum of four times daily.
- **Leak & Mechanical Integrity Testing:** In addition to continuous monitoring, the vapor recovery system would continue to be leak tested a minimum of once per quarter to ensure system integrity. Specifically, the leak tests are conducted by a third-party pursuant to the requirements of SCAQMD Rule 1173 Leak Detection and Repair (LDAR Program). The LDAR program is in compliance with USEPA Method 21 and uses a hand-held vapor analyzer with visual enhancement using the FLIR cameras. In addition to the quarterly tests, SHP field crew would continue to perform monthly internal FLIR inspections of the vapor recovery system to confirm there are no fugitive leaks, including potential GHG's. Because the vapor recovery pipelines are equipped with extensive safeguards, such as the oxygen leak detectors, and are inspected regularly, the system is considered exempt from additional pipeline testing requirements outlined under CCR Title 8, Section 6533 (Pipelines, Fittings, and Valves) and CCR Section 1774.1(f) (Pipeline Inspection and Testing). Nonetheless, SHP's operations

personnel have and would continue to perform periodic mechanical integrity tests on segments of the vapor recovery pipeline system to further confirm its safe operation.

- **Misc. Protections/Fugitive Controls:** In addition to the measures summarized above, SHP’s vacuum truck crews would continue to extract any condensate that may have collected in low spots found throughout the vapor recovery system, a minimum of three times per week. Additionally, if field monitors report any unusual decreases in vacuum pressure, SHP’s operations personnel would be dispatched more frequently to ensure any condensates are properly contained. By collecting condensate quickly, SHP would ensure that potential fugitive emissions are minimized and in compliance with SCAQMD rules and regulations, including Rule 1173. (Detailed quantitative analysis of fugitive emissions is provided in Section 3.2)

Lastly, SHP’s vapor recovery system would continue to be covered by an underground damage prevention program (Dig Alert) and maintained under a California Accidental Release Program/Risk Management Plan/Process Safety Management plan, which necessitates detailed and prescriptive requirements for monitoring and maintaining mechanical integrity of all plant equipment beyond those required by CalGEM.

2.4.2 New Wells

SHP proposes to drill 46 new wells (both production and injection wells) at the seven drill sites on an as-needed basis, over the duration of the proposed CUP extension period. As with current operations, these activities would occur entirely within the existing CUP boundaries.

SHP’s oil and gas production has been, and will continue to be, cyclical and dependent upon market demands, economic cycles, and other factors beyond SHP’s control (e.g., geological studies, production capacity of wells drilled, availability of required materials and services). As such, SHP’s drilling activities for both production and injection wells would vary from year to year. SHP estimates that over the 20-year CUP period, it would drill up to 46 new wells (total of all new wells at the seven sites). If approved, this maximum number of new wells would be made a condition of approval of the CUP. Drilling of new wells requires a discretionary permit from CalGEM, as well as ministerial permits from the City. SHP proposes to drill a maximum of five new wells in any given year, although the average number of new wells to be drilled each year would be two. SHP proposes a combined total maximum of nine new drill/redrills in any given year, which could occur on any of the seven sites. Table 2.4-8 summarizes SHP’s forecasted future drilling/redrilling and new well cellar activity that could occur at each individual drill site during the life of the Project. If approved, both the annual limit and limit at each drill site would be made a condition of approval of the CUP.

Drilling activity associated with the new wells would be the same process as described for redrilling. Consistent with existing operations, during intermittent drilling operations, an additional four to eight employees/contractors per day would work at the specific drill site

where the activities are occurring. While drilling of new wells would range in duration dependent upon the target depth of the well and specific geologic conditions encountered, on average a new well can generally be completed within a month.

2.4.3 Drill Site #2 Gas Processing System Modification

The current natural gas processing facility processes up to 2,000 thousand standard cubic feet (MCF) of natural gas per day. The natural gas produced in the mature Long Beach Oil Field has a high content of natural gas liquids (butane, propane, etc.) and inert gases (principally nitrogen and carbon dioxide [CO₂]). The current low temperature separation (LTS) unit and related membrane unit are critical to process this gas to meet utility pipeline specifications. The gas processing facility also provides gas vacuum to production tanks and other facilities. The current LTS and membrane units are the only mission critical components in the facility that are not backed-up, and therefore installation of the redundant system would ensure the facility can maintain safe operation during periods of maintenance or repairs.

SHP proposes to modify its current natural gas processing system at Drill Site #2 by adding a back-up LTS and a back-up membrane unit for the removal of inert gas. The estimated area of disturbance for the gas processing system modification is approximately 0.1 to 0.2 acre, located within the central portion of Drill Site #2.

SHP would connect the upgraded system to a new gas sales meter and pipeline provided by the Southern California Gas Company that is located on an area of Drill Site #2 that has an approved easement between SHP and Southern California Gas Company.⁶ This sales outlet is in addition to and will provide back-up to the current Long Beach Energy gas sales outlet. As part of the proposed Project, SHP would add a booster compressor to the gas processing system to provide the line pressure required to move gas into the Southern California Gas Company system. SHP also proposes to add a “CEB” technology clean burning combustion unit to handle waste gas streams that currently are recycled through the facility.

The proposed LTS unit would be sized to process 2,000 MCF/day and the membrane unit sized to process 1,500 MCF/day. Both pieces of equipment would be sized at lower process rates than the current equipment, which will ensure operational efficiency. Ultimately, the addition of the back-up LTS and membrane units to facilitate the Southern California Gas Company connection would allow for improved operational efficiency and flexibility for the entire natural gas processing system at Drill Site #2.

The foundations and electrical installations require building permits from the City of Signal Hill, which were issued in fall 2022. The foundations are located immediately adjoining existing facilities at Drill Site #2. Process piping and electrical conduits in and around the actual

⁶ The installation and operation of the gas meter and pipeline are already approved activities by the City and are considered the environmental baseline condition and considered a component of the ongoing operations of the proposed Project.

equipment packages are located above ground. The redundant processing system would be installed only if approved by the City following completion of this CEQA review.

2.4.4 Well Cellar Construction

SHP proposes to construct new ancillary well cellars at the drill sites, as needed. The maximum number of new well cellars that are proposed to be constructed over the 20-year life of the Project is 20 and the well cellars would be located anywhere within the existing boundaries of each of the drill sites, subject to the CUP-site specific limits outlined in Table 2.4-8, below. If approved, this limit on total number of well cellars would be made a condition of approval of the CUP. Construction of new well cellars also require a building permit from the City and a methane site assessment per Section 16.24 of the Signal Hill Municipal Code. As with SHP's current protocols, new well cellars would be constructed by excavating a shallow hole (approximately six feet wide, six feet long, and five feet deep) using a back-hoe type excavator. To construct a new well cellar, the backhoe would have to operate at the given drill site for up to four hours to excavate the necessary depression. The pre-cast concrete box would then be transported to the appropriate drill site via delivery truck. Once excavation is complete, a pre-cast concrete box or a large diameter galvanized round steel pipe would be placed into the excavated hole to secure the new well cellar. Needed connectivity to power or other equipment would be considered as part of the building permit review. As such, well cellar construction would generally be completed within a single day, using SHP's existing equipment and onsite employees, as well as two additional onsite employees/contractors.

Consistent with SHP's existing protocols, construction activities would occur Monday through Friday between the hours of 7:00 a.m. and 6:00 p.m., and the excavation work would be done per SHP's existing SCAQMD Rule 1166 permit for VOC emissions from soil. Accordingly, onsite areas where new well cellars are proposed would be inspected and monitored prior to and during excavation. Well cellar excavation, monitoring, and soil evaluation/sampling would continue to be conducted in accordance with applicable City, state, and federal regulations. Excavated soil would be transported to the existing staging area on California Ave. and handled as described in Section 2.4.15, Soils Management. Any soil encountered that exceeds Rule 1166 protocols will be handled per Rule 1166 mandates. Therefore, if potentially contaminated soil is encountered, that soil would be isolated in a stockpile covered completely with plastic sheeting pending evaluation by an environmental engineer, sampling, and/or lab analysis to determine the proper disposal procedure of the contaminated soil.

2.4.5 Drill Site Redrilling, New Drilling, and Well Cellar Maximums

As discussed above, the project proposes redrilling, new well drilling, and construction of new well cellars over the term of the CUP, up to the maximums identified above. However, as an additional limitation on operational activities at each drill site, redrilling, new wells, and well

cellar construction would be limited on each drill site to the maximums identified in Table 2.4-8, below, over the term of the CUP, as a condition of CUP approval.

Table 2.4-8: Maximum Future Drilling/Redrilling Activity at Each Drill Site

Drill Site	Drilling (new wells)	Redrilling (existing wells)	New Well Cellars
Drill Site #1	10	10	10
Drill Site #2	10	15	5
Drill Site #3	15	10	5
Drill Site #4	15	10	5
Drill Site #5	15	12	5
Drill Site #6	2	2	2
Drill Site #7	2	1	2

2.5 Construction Activity

Construction for the additional gas system components proposed at Drill Site #2 would be completed in two phases. The booster compressor and CEB burner would be installed in Phase 1 following Project approval. The LTS and membrane units would be installed in Phase 2, approximately one year after Phase 1. Both Phase 1 and Phase 2 would span approximately 12 weeks, with construction activities occurring Monday through Friday between the hours of 7:00 a.m. and 6:00 p.m. During temporary construction activities, it is estimated that up to six additional contractors would be needed onsite and would travel to and from Drill Site #2 each day.

The construction process would start with excavations for underground process piping, electrical conduits, and control cable conduits as well as reinforced concrete foundations for each piece of equipment. The LTS and membrane units would be delivered by the supplier with certain piping and controls already installed and mounted on an independent steel skid unit. The skid units would be installed on the foundations and secured per the foundation plans.

Table 2.5-1 provides the construction equipment and vehicles required to complete the natural gas processing facility modifications, the estimated on-site engine operating hours for the construction equipment, and the vehicle trips required to and from the construction site. It is estimated that each daily vehicle and truck trip to and from the construction site would require a travel distance of 10 miles or less one way.

Table 2.5-1: Construction Equipment and Vehicle Activity Summary for Natural Gas Processing Facility Improvements

Equipment	Onsite Engine Activity		Offsite Vehicle Activity	
	Total Operating Engine Hours	Average Engine Hours/Day	Total Vehicle Trips Generated	Average Vehicle Trips/Day
Backhoe	40	8	0	0
Dump Truck (6 wheel)	32	4	2	2
Water Truck	40	2	0	0
Crane Truck with Flat Bed Trailer	104	8	4	2
Construction Gear Truck	0	0	84	4
Electrician’s Gear Truck	0	0	32	4
Welder with Welder’s Truck	144	2	36	4
Concrete/Pavement Saw	16	2	0	0
Redi-Mix Concrete Truck	64	2	8	2

2.5.1 Construction Vehicle Trips

The vehicle trips associated with Project construction are described below in Table 2.5-2. Project vehicle trips would be generated during construction of the proposed gas system modifications at Drill Site #2 and construction of new well cellars. These additional vehicle trips would be temporary, and once construction is complete, would not contribute to additional ongoing vehicles trips associated with operations. Construction of the proposed gas system modifications would require up to six additional contractor light-duty vehicles each day. Additionally, a maximum of four additional heavy-duty trucks (flatbed equipment deliveries, and ready-mix concrete trucks) would travel to Drill Site #2 on a given construction day. Construction of a new well cellar would require two additional onsite employees/contractors (equivalent to four additional daily one-way vehicle trips), and one additional heavy-duty truck to transport equipment.

Assuming temporary gas system construction vehicle trips and vehicle trips associated with well cellar construction, the Project would generate an estimated maximum equivalent of 36 additional daily one-way vehicle trips (equivalent to 18 roundtrips, and an estimated 94 vehicle miles traveled [VMT] per day) due to employees, contractors, and heavy-duty work trucks travelling to and from the drill sites.

Table 2.5-2: Vehicle Trips Associated with Project Construction

Activity	Frequency	Vehicle Type	Roundtrips (inbound + outbound) ³³	One-Way Trips	Average Roundtrip Distance (miles)	Daily VMT
Gas System Modification - Contractor/ Gear Trucks ¹	Daily	Light-Duty	6	12	3	18
Gas System Modification - Heavy-Duty Trucks (Equipment/Deliveries) ¹	Daily	Heavy-Duty	2	4	5	20
Gas System Modification - Ready-Mix Concrete Trucks ¹	Daily	Heavy-Duty	2	4	10	40
Well Cellar Construction - Employee/ Contractor ²	Intermittently	Light-Duty	2	4	3	6
Well Cellar Construction - Equipment Delivery ²	Intermittently	Heavy-Duty	1	2	5	10
		Proposed Daily Vehicle Trips	18	36	Proposed Daily VMT	94

Table Notes:

1. Construction of the gas system modifications would be temporary (completed in approx. 6 months or less), and vehicle trips would occur Monday-Friday only. Although vehicle activity would be intermittent, conservatively it's assumed all penitential contractor light-duty and heavy-duty/Ready-mix concrete truck trips would occur in a single construction day. Once the system is fully installed, existing SHP employees/contractors would continue to conduct operations (i.e., there would be no permanent increase in vehicle trips to/from CUP Site #2 as a result of the gas system modifications).
2. Although well cellar construction would not occur on a typical operational day, conservatively its assumed one (1) SHP employee and one (1) equipment delivery roundtrip using a flatbed truck would occur.
3. For the purpose of circulation impacts, a Passenger Car Equivalence (PCE) Factor of two is applied to heavy duty trucks per Federal Highway Administration (FHWA) guidance (<https://www.fhwa.dot.gov/reports/tswstudy/Vol3-Chapter9.pdf>), which states "On level terrain and in uncongested conditions conventional trucks may be equivalent to about **two** passenger cars in terms of their impact on traffic flow." Although application of a PCE is more appropriate for the assessment of a project's impact on the level of service of impacted roadways, the VMT calculation herein also incorporates the PCE factor for heavy-duty trucks in order to simplify the analysis while also providing a more conservative estimate of VMT associated with the Project.

SECTION 3 Evaluation of Environmental Impacts

3.1 Impact Assessment Methodology

This section evaluates the potential environmental impacts of the continued operation in addition to the proposed changes to the gas plant at Drill Site #2 and drilling and operation of 46 new wells.

Each environmental resource section provides background information and describes the environmental setting (baseline conditions) to characterize the existing environment that would be affected by these Project components. The regulatory framework relevant to each environmental resource category is then described. Next, environmental impacts of the Project are evaluated in conformance with CEQA PRC Section 21000 et seq.) and the State CEQA Guidelines (Title 14, California Code of Regulations, Section 15000 et seq.) including the CEQA Checklist included as Appendix G to the Guidelines. If an impact is potentially significant after compliance with the regulatory framework, then mitigation measures are specified to reduce potentially significant impacts to a level of less than significant if feasible.

As described in the Initial Study published in January 2023 at the start of the CEQA scoping period, under implementation of the proposed Project, no impacts would occur to agriculture and forestry resources, land use and planning, mineral resources, population and housing, public services, and recreation, and impacts would be less than significant for wildfire. Therefore, these resource areas were not discussed further in this EIR. The Initial Study did identify the potential for significant impacts to occur with regard to the following 13 resource areas:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Transportation
- Tribal Cultural Resources
- Utilities and Service Systems

For each of the resource categories above the impact analyses presented focuses only on those issues identified as a potentially significant impact in the Initial Study and for which the Initial Study indicated that mitigation measures would be required to reduce impacts to less than significant levels or that additional analysis was necessary. Those issues within each resource category which were determined to be less than significant or no impact in the Initial Study are not repeated in this EIR.

3.1.1 Environmental Baseline

The analysis of each environmental resource category begins with an examination of the existing physical setting (baseline conditions as determined pursuant to Section 15125(a) of the State CEQA Guidelines) that may be affected by the Project. The environmental baseline conditions are defined as the existing physical conditions in the affected area as they existed at the time the NOP is published, including consideration of historical trends in those conditions. Therefore, the environmental baseline of the Project includes the past operation of the seven drill sites.

As described in the Project description, the City determination to issue a long-term extension of the CUP would include an additional 20 years of operation in accordance with the CUP conditions of approval. The proposed 20-years of continued operations are evaluated through comparison of existing setting (baseline) conditions to established regulatory thresholds and permit conditions to identify if any exceedances of thresholds currently exist that may continue that would require implementation of mitigation measures to reduce existing impacts (if any) to less than significant levels. In other words, the regulatory framework including CUP conditions of approval are considered to determine whether enforceable regulatory compliance measures are already in place that reduce the potential for adverse impacts to less than significant levels.

In addition, this EIR evaluates the effects of the Project that would occur as changes to the environmental setting that are attributable to construction and operation of the Project (i.e., drilling new wells, as well as construction of new well cellars and installation of new equipment at the gas plant).

3.1.2 Significance Criteria

Significance criteria are identified for each environmental resource category. The significance criteria serve as benchmarks for determining if components of the Project or an alternative would result in a significant adverse environmental impact when evaluated against the environmental baseline conditions. Where quantitative thresholds are set by a regulatory agency, these are defined in the resource section and potential effects are evaluated in comparison to these quantitative thresholds (e.g., air quality, noise, hazards). Where there are not quantitative thresholds, potential effects are evaluated guided by the CEQA Checklist questions. According to State CEQA Guidelines Section 15382, a significant effect on the

environment means “...a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Project...”

3.1.3 Impact Analysis

This EIR considers four categories of environmental impacts, as follows:

- **No Impact.** The Project would not have any measurable environmental impact on the environment.
- **Less than Significant Impact.** The Project may have the potential for affecting the environment, although these impacts will be below levels or thresholds that the City of Signal Hill or other responsible agencies consider to be significant.
- **Less than Significant Impact with Mitigation Incorporated.** The Project may have the potential to generate impacts that will have a significant impact on the environment. However, the level of impact would be reduced to levels that are less than significant with the implementation of mitigation measures.
- **Potentially Significant Impact.** The Project may result in environmental impacts that are significant and cannot be reduced to levels that are less than significant even with the implementation of mitigation measures.

3.1.4 Formulation of Mitigation Measures and Mitigation Monitoring Program

For those impacts that are not altogether avoided or minimized to less than significant levels through enforcement of existing regulatory requirements, feasible and enforceable mitigation measures are formulated to eliminate or reduce the level of the impacts and focus on the protection of environmental resources. The effectiveness of a mitigation measure is subsequently determined by evaluating the impact remaining after its application. Those impacts meeting or exceeding the impact significance criteria after mitigation are considered residual impacts that remain significant. Implementation of more than one mitigation measure may be needed to reduce an impact below a level of significance.

The mitigation measures recommended in this document are identified in the impact assessment sections and will be presented in a Mitigation Monitoring and Reporting Program (MMRP) in the Final EIR and will be considered by the City of Signal Hill as conditions of approval in the CUP extension. The Draft MMRP is included as Appendix B to this Draft EIR. Compliance with the regulatory framework is also considered in assessing the potential significance of an environmental impact, but the specific requirements are not identified as mitigation measures because they have a separate monitoring, reporting, and enforcement framework through the agency with jurisdiction.

3.1.5 Cumulative Impacts

Section 3.12, Cumulative Impacts, provides a list of other related future projects near the location of the proposed Project and alternatives. Each environmental resource category in Section 3.12 presents the cumulative impact scenario, the focus of which is to identify the potential impacts of the Project that might contribute to a significant impact when viewed in conjunction with the environmental impacts of other projects in the cumulative scenario.

3.1.6 Impacts of Alternatives

Section 4, Alternatives to the Proposed Project, provides a description of alternatives to the proposed Project: No Project Alternative, 2-Year Permit Term Alternative, 10-Year Permit Term Alternative, and a description of alternatives considered but eliminated from further evaluation. The potential impacts of the proposed alternatives are evaluated in comparison to the proposed Project using the same methodology as described above. A summary of the collective impacts of each alternative in comparison with the impacts of the proposed Project is included in Table 4.5-1 in Section 4.

3.2 Aesthetics Resources

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS. Except as provided in Public Resources Code Section 21099, would the project:				
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.2.1 Environmental Setting

The existing visual setting includes the current state of the CUP sites which are all developed and operational oil and gas extraction and processing facilities. Visual features in and around the seven CUP sites and the surrounding public viewpoints of potential concern are discussed below.

In accordance with the City’s Oil and Gas Code, the perimeter of Drill Sites #1- #7 are screened from public view, through a combination of existing block walls, fences/screens, and landscaping. Perimeter landscaping has also been planted along the majority of the CUP drill site boundaries, especially those facing public rights-of-way. Each access point is gated and locked. Signs are located at the access points and on the perimeter fencing to identify the operations and warn the public that no public access/trespassing is allowed. The drill sites are monitored 24 hours per day by SHP employees.

Nighttime lighting has been installed at the drill sites. Existing nighttime lighting is minimal and only installed where necessary to ensure employee safety or site security. In compliance with applicable City standards and industry practices, the existing lighting has been installed in a way which confines illumination to the site and/or to areas that do not include light-sensitive uses and minimizes glare onto adjacent properties.

3.2.1.1 Roadways

The drill sites are located adjacent to numerous public roadways and rights-of-ways. Nearby prominent roadways include the following: Interstate 405 (I-405), Atlantic Avenue, and E. Spring Street (near Drill Site #1); Orange Avenue (adjacent to Drill Site #2); E. Willow Street (south of Drill Site #3); Temple Avenue/Obispo Avenue (east of Drill Site #5); and Redondo Avenue (east of Drill Sites #6 and #7).

No designated scenic highways are located within the boundaries of the City of Signal Hill. No candidate or officially designated state scenic highways are located within the City. The closest eligible state scenic highway is located southeast of the City and includes a portion of State Route 1 (SR-1) which ends at the Traffic Circle neighborhood in Long Beach (Caltrans 2018). The closest drill sites (#6 and #7) are located approximately 0.6 miles from the eligible segment of the highway. Due to the distance between the nearest drill site as well as intervening topography and built-out urban structures, the Project would not be visible from this portion of SR-1 (Sespe Consulting 2022a). The City of Signal Hill designated a roadway that surrounds the Hilltop area as a scenic route. The roadway includes Panorama Drive, 23rd Street, 21st Street and portions of Temple Avenue. This scenic route provides a link between the Civic Center/Hinshaw Park and the Alamitos 1 Well State Historical Monument, which is located on the east side of the Hill at Temple and Hill streets. The route provides views of urban Southern California from the Hilltop area (City 1986). Drill sites #4 and #5 are visible from Panorama Drive in the Hilltop area, but the sites are visually screened with trees and fencing and do not obstruct views from the roadway.

The existing topography surrounding most drill sites is generally flat. Signal Hill, which is located within the center of the City limits, represents the only elevated topographical feature in the Project vicinity. Various public hiking trails are located near Drill Sites #4 and #5.




3.2.1.2 Local Viewpoints and Scenic Vistas

The hilltop area of Signal Hill is considered a very valuable resource in the City, and views from the hilltop are a valued public resource, including the scenic vistas from Hilltop, Sunset View, and Discovery Well parks (City 2001). One of the CUP sites (Drill Site #5) is located within the Hilltop Area Specific Plan area and in the vicinity of these parks. Drill Site #5 is located downslope from the scenic hilltop vista areas, and while visible from the vista areas, the site does not obstruct views, as it is visually screened with existing trees and fencing.

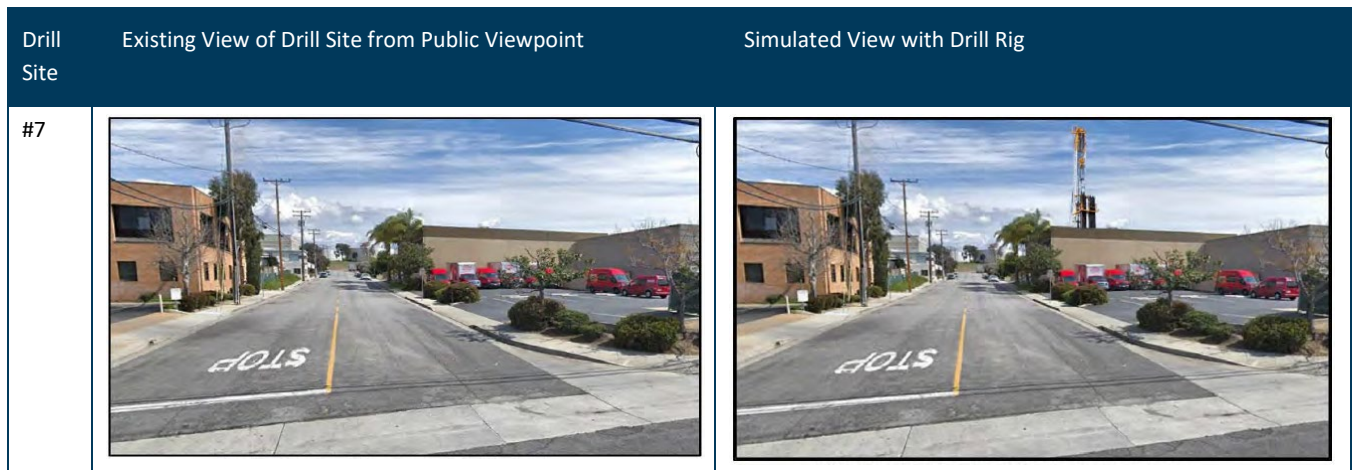
As part of the visual impact analysis completed for the Project (see Appendix C, various viewsheds were mapped in the field. Viewsheds were established by determining publicly accessible areas surrounding the drill site perimeters that would have a potentially unobstructed or partial line-of-sight view of the proposed Project activities. The areas surrounding the drill sites are mostly flat and developed with existing buildings, fences/walls, and landscaping, and these existing structures and screening generally obscure views of the drill sites from more distant viewpoints. Therefore, the Project viewsheds are generally limited to areas located immediately adjacent to the perimeter of the drill sites along publicly accessible roadways (Sespe Consulting 2022a).

Public viewpoints were analyzed for each of the seven drill sites. These seven locations represent areas that are heavily travelled, surrounding the Project site and along nearby routes of travel, and are therefore considered to have potential visual sensitivity. Visual impacts at these closest viewpoints conservatively account for potentially affected views at locations farther from the drill sites. Photo simulations were developed for each public viewpoint and are provided in Table 3.2-1 below. These show the existing view for each drill site as well as the simulated view with the addition of a drilling rig.

Table 3.2-1: Existing and Simulated Views of CUP Sites

Drill Site	Existing View of Drill Site from Public Viewpoint	Simulated View with Drill Rig
#1		
#2		

Drill Site	Existing View of Drill Site from Public Viewpoint	Simulated View with Drill Rig
#3		
#4		
#5		
#6		



Source: Sespe Consulting 2022a

3.2.2 Regulatory Setting

3.2.2.1 U.S. Bureau of Land Management Visual Resources Management System

The U.S. Bureau of Land Management (BLM) developed the Visual Resources Management (VRM) System to objectively rate the quality of visual resources and evaluate changes in scenic quality attributed to a proposed change in land use. This methodology is a federal standard and is based on the BLM visual impact assessment procedures provided in the *Visual Resources Management Manual-Section 8400* (BLM 1984). This system uses quantitative and qualitative methods to measure potential visual impacts and includes the following: defining the project setting and viewshed, identifying sensitive view receptors for assessment, analyzing the baseline visual quality and character of the identified views, depicting the visual appearance of the project from the identified views, assessing the project’s impacts to those views in comparison to their baseline visual quality and character, and proposing methods to mitigate any potentially significant visual impacts identified. The visual impact analysis completed for the Project followed this methodology (Sespe Consulting 2022a).

3.2.2.2 California Scenic Highway Program

Caltrans manages the State Scenic Highway Program and provides guidance to agencies seeking official designation of a State Scenic Highway. A highway may be designated as “scenic” depending on how much of the natural landscape can be seen by travelers, the scenic quality of the surrounding landscape, and the extent to which development intrudes upon the traveler’s enjoyment of the view. Highways may also be identified as “candidate” scenic highways, pending official designation. State laws that govern the Scenic Highway Program are found in the Street and Highways Code, Sections 260 through 263. Caltrans maintains a list of eligible and officially designated State scenic highways, which are identified in Section 263 of the Streets and Highways Code (Caltrans 2022). As described in Section 3.2.1 above, no officially designated State scenic highways are located within the City of Signal Hill.

3.2.2.3 Signal Hill General Plan

The Land Use Element (2001) and the Environmental Resources Element (1986) of the City of Signal Hill General Plan address aesthetics in goals and policies, as outlined in Table 3.1-2. The Land Use Element also includes that pumping units shall be painted and landscaped to soften visual impacts.

Table 3.2-2: Applicable City of Signal Hill General Plan Goals and Policies

Element	Goal	Policy	Applicability
Land Use	Goal 3: Assure a safe, healthy, and aesthetically pleasing community for residents and businesses.	Policy 3.2: Enhance the interface between existing and future development and oil production activities to protect the access to the resource while mitigating adverse impacts of oil field operations within an urban area.	The entire perimeter of each drill site is screened from public view, through a combination of block walls, fences/screens, and landscaping. The Project would not be inconsistent with the visual character of the surrounding urban environment (which has a long history of oil and gas operations).
		Policy 3.3: Ensure a sensitive transition between commercial or industrial uses and residential uses by means of such techniques as buffering, landscaping, and setbacks.	The entire perimeter of each drill site is screened from public view, through a combination of block walls, fences/screens, and landscaping. All Project operations would be conducted within existing drill site footprints. While the drill rig would be partially visible during intermittent drilling/redrilling operations, visual effects would be temporary. Drill rigs have been operating at the sites for decades, and views of the equipment are not inconsistent with the existing, developed urban character of the area.
		Policy 3.12: Encourage and promote high quality design and physical appearance in all development projects.	Existing perimeter barriers and landscaping would continue to be maintained throughout the life of the Project.
Environmental Resources	Goal 1: Maintain and enhance the identity and aesthetic quality of Signal Hill as a City with striking view potential, and a City that is carefully managing its transition from resource extraction to balanced land uses.	Policy 1.1: Protect views both to and from the Hill and other scenic features. This will extend to all new development, and to major rebuilding and additions.	All CUP sites are visually screened around the perimeter and operations would not occur outside the existing perimeter. Drill Site #6 currently has two wells outside of the fenced area which the City is requiring to be fenced and will be completed in spring 2023. Continued intermittent use of drill rigs at the drill sites would not be inconsistent with the visual character of the surrounding areas (including areas atop the hill adjacent to the Drill Sites #4 and #5). The Project would not

Element	Goal	Policy	Applicability
			impact views from/of scenic features within Signal Hill.
	Goal 2: Maintain and enhance the City's unique cultural, aesthetic and historic areas.	Protect and enhance the State Historical Landmark at the Alamitos Well Site #1.	The City has an extensive oil and gas history, and existing facilities (including drill sites) have been in operation for decades. The Project would not impact existing historical structures or areas. Alamitos Well Site #1 is located approximately 0.2 miles south of Drill Site #5. Due to distance and intervening topography/landscaping, Project operations within the CUP sites would not be visible from this location.
	Goal 4: Manage the production of economically valuable resources in the city to achieve a balance between current market forces and long-term community values.	Policy 4.1: Improve the interface between oil production activities and urban development, both for existing and new projects.	Project would adhere to the CUP conditions of approval specific to landscape and fencing. Visual impacts from use of a drill rig at drill sites would be temporary and views of equipment would not be considered inconsistent or intrusive compared to the existing character of the area.
		Policy 4.4: Minimize and eliminate where feasible the adverse environmental impact of resource-production activities. Also provide adequate setback and open space where oil-production activities continue adjacent to urban development.	Drill sites are screened from nearby land uses through the use of perimeter walls and landscaping. Any new well cellars constructed and/or wells drilled within the drill sites would comply with the setback requirements outlined within the City's Oil and Gas Code (Title 16).

Source: City 1986, 2001

The City adopted a view policy and in the Hilltop Area Specific Plan (SP-2), a view ordinance, with the goal of balancing existing residential views and the right of property owners to develop vacant property in accordance with the Hilltop Area Specific Plan or other zoning standards. The Hilltop Area Specific Plan aims to preserve the public view and prohibits construction of new dwellings that may interrupt the unobstructed views from the Hilltop, Sunset View, or Discovery Well parks (City 2001). Drill Site #5 is located within this specific plan area. However, the site is visually screened from residential views, and the Project would not result in any development of vacant areas which would have the potential to impact existing views from the surrounding area.

3.2.2.4 City Oil & Gas Code

The City adopted Title 16 of the City's Municipal Code, known as the Oil and Gas Code, in 1986. Certain aesthetic requirements were mandated with the adoption of the Signal Hill Oil Code in 1986, specifically all pumping units and tanks must be painted and five trees and seven shrubs must be planted for each pumping unit and tank (City 2001). In addition to landscaping and painting, Title 16 also includes standards for lighting and height requirements which SHP follows and would continue to implement as part of the Project. To provide visual screening in accordance with Title 16, perimeter landscaping and/or decorative concrete block walls/fencing surround each of the CUP sites.

3.2.3 Impact Assessment

AES (d). Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less than Significant with Mitigation Incorporated. Operations at the drill sites would continue to occur primarily during daylight hours; however, ongoing operations include redrilling wells, may require drilling activity over a 24-hour period. Consistent with existing operations, temporary portable nighttime lighting may be necessary during these operations to ensure a safe working environment. Any additional nighttime lighting required for safety during redrilling operations would be temporary and spread among all the drill sites. However, if required, temporary nighttime lighting during ongoing operations could have a potentially significant impact on adjacent residential areas.

No additional permanent nighttime lighting structures are proposed as part of the new Project activities. The gas plant modifications at Drill Site #2 would not require the installation of additional lighting, as existing fixtures would sufficiently light the onsite areas during construction and operation. Additionally, none of the proposed structures or operational activities associated with the Project are expected to result in a new source of glare. Consistent with existing CUP conditions and the City's Oil and Gas Code, any new structures, such as those associated within the gas plant modifications at Drill Site #2, would be painted with non-reflective, muted tones.

As with existing redrilling, new drilling activity could also occur over a 24-hour period. Temporary nighttime lighting may be necessary during these operations. As discussed in the Project Description, drilling new wells would likely be spread among all the drill sites and not concentrated at any one drill site in any given year. Overall, if the maximum of five wells are drilled and six wells are redrilled in a given year, temporary nighttime lighting may be required for a maximum 6.5 months of each year for the first 10 years of the Project, although the use of nighttime lighting for new drilling would be spread among the different drill sites and not concentrated at any one specific site. If required, temporary nighttime lighting could have a potentially significant impact on adjacent residential areas.

Mitigation Measure AES-1: If portable nighttime lighting is required during redrilling/drilling operations, nighttime lighting fixtures would be designed to confine illumination to the specific working areas on drill sites and would avoid spillover into offsite areas with light-sensitive uses, including adjacent residential areas. Specifically, nighttime lighting fixtures would be fully shielded, directed downward, and installed and maintained in such a manner to avoid light trespass beyond the lot line in excess of those amounts set forth in Section 16.20.070 of the City’s Oil and Gas Code (Signal Hill Municipal Code – Title 16). If required, nighttime lighting would be limited to portable lights or small lights affixed to equipment (e.g., vehicles, drill rigs, etc.) for safety purposes.

Residual Impacts

Incorporation of **MM AES-1** would ensure that measures are in place to reduce potential impacts on of nighttime lighting on light-sensitive uses to a less than significant level.

3.3 Air Quality

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.3.1 Environmental Setting

The SCAQMD’s jurisdiction consists of a four-county region which includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, the Riverside County portion of the Salton Sea Air Basin, and the non-Palo Verde, Riverside County portion of the Mojave Desert Air Basin. The SCAQMD region is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. SHP CUP sites are located within the Los Angeles County portion of the South Coast Air Basin (SCAB).

3.3.1.1 Meteorological Conditions

The climate in the SCAB is generally characterized by sparse winter rainfall and hot summers tempered by cool ocean breezes. A temperature inversion, a warm layer of air that traps the cool marine air layer underneath it and prevents vertical mixing, is the prime factor that allows contaminants to accumulate in the SCAB. The mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds. The climate of the area is not unique, but the high concentration of mobile and stationary sources in the western portion of the SCAB, in addition to the mountains, which surround the perimeter of the SCAB, contribute to air quality challenges in the region.

Meteorological data for various monitoring stations is maintained by the Western Regional Climate Center. Meteorological data for the Project site is expected to be similar to the data recorded at Long Beach Daugherty Field which is located one to two miles north/northeast of the Project site(s). Over the 67-year period from 1949 through 2016 (the most recent data available), the average annual precipitation was 12.01 inches.

Wind flow patterns play an important role in the transport of air pollutants in the SCAB. The winds flow from offshore and blow eastward during the daytime hours. In summer, the sea breeze starts in mid-morning, peaks at 10-15 miles per hour, and subsides after sundown. There is a calm period until about midnight. At that time, the land breeze begins from the northwest, typically becoming calm again about sunrise. In winter, the same general wind flow patterns exist, except that summer wind speeds average slightly higher than winter wind speeds. This pattern of low wind speeds is a major factor that allows the pollutants to accumulate in the SCAB. The normal wind patterns in the SCAB are interrupted by the unstable air accompanying the passing storms during the winter, and infrequent strong northeasterly Santa Ana wind flows from the mountains and deserts north of the SCAB. Wind speed data collected by the National Oceanic and Atmospheric Administration at the Long Beach Airport station (approximately 1 mile from City of Signal Hill) indicates that the windiest month of the year in Long Beach is June, with an average hourly wind speed of 6.3 miles per hour in 2021. The calmest month of the year in Signal Hill is November, with an average hourly wind speed of 3.7 miles per hour.

3.3.1.2 Criteria Air Pollutants

Air quality is defined by ambient air concentrations of seven specific pollutants identified by the USEPA to be of concern with respect to health and welfare of the general public. These specific pollutants, known as “criteria air pollutants,” are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. Criteria air pollutants include CO, O₃, nitrogen oxides (NO_x), sulfur oxides (SO_x), particulate matter of less than 2.5 microns (PM_{2.5}), particulate matter of 10 microns (PM₁₀), and lead (Pb) (Table 3.3-1).

Table 3.3-1: Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS (ppm)	CAAQS ($\mu\text{g}/\text{m}^3$)	NAAQS (ppm)	NAAQS ($\mu\text{g}/\text{m}^3$)
Ozone (O_3)	1-hour	0.09	180	--	--
	8-hour	0.07	137	0.070	137
Nitrogen Dioxide (NO_2)	1-hour	0.18	339	0.100	188
	Annual	0.03	57	0.053	100
Sulfur Dioxide (SO_2)	1-hour	0.25	655	0.075	196
	3-hour	--	--	0.5	1,300
	24-hour	0.04	105	0.14 (for certain areas)	0.030 (for certain areas)
	Annual arithmetic mean	--	--	0.03	--
Carbon Monoxide (CO)	1-hour	20	23 (mg/m^3)	35	40 (mg/m^3)
	8-hour	9	10 (mg/m^3)	9	10 (mg/m^3)
Particulates (as PM_{10})	24-hour	--	50	--	150
	Annual arithmetic mean	--	20	--	--
Particulates (as $\text{PM}_{2.5}$)	24-hour	--	--	--	35
	Annual	--	12	--	12
Lead (Pb)	30-day	--	1.5	--	--
	Calendar average	--	--	--	1.5 (for certain areas)
	3-month (rolling average) ¹	--	--	--	0.15
Sulfates (as SO_4)	24-hour	--	25	--	--
Hydrogen Sulfide (H_2S)	1-hour	0.03	42	--	--
Vinyl Chloride	24-hour	0.01	26	--	--

Source: CARB 2022a

Notes: A rolling average is a calculation to analyze data points by creating series of averages of different subsets of the full data set. ppm = part(s) per million; $\mu\text{g}/\text{m}^3$ = microgram(s) per cubic meter

Under the provisions of the U.S. Clean Air Act, the Los Angeles County portion of the SCAQMD has been classified as nonattainment (extreme, moderate, serious), nonattainment, attainment, maintenance, partial nonattainment, unclassified or no federal standard under the established National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for various criteria pollutants. Table 3.3-2 provides the SCAQMD’s designation and classification based on the various criteria pollutants under both NAAQS and CAAQS.

Table 3.3-2: SCAB NAAQS and CAAQS Attainment Status

NAAQS	Attainment Status
8-Hour Ozone (2015)	Extreme - Nonattainment
8-Hour Ozone (2008)	Extreme - Nonattainment
8-Hour Ozone (1997)	Extreme - Nonattainment
1-Hour Ozone (1979)	Extreme - Nonattainment
PM _{2.5} (2012)	Serious - Nonattainment
PM _{2.5} (2006)	Serious - Nonattainment
PM _{2.5} (1997)	Moderate - Nonattainment
PM ₁₀ (1987)	Attainment
SO ₂ (2010)	Attainment
SO ₂ (1971)	Attainment
Lead (2008)	Nonattainment
Lead (1978)	Attainment
CO (1971)	Serious - Maintenance
NO ₂ (1971)	Maintenance
CAAQS	Attainment Status
Ozone	Nonattainment
PM _{2.5}	Nonattainment
PM ₁₀	Nonattainment
CO	Attainment
NO ₂	Attainment
SO ₂	Attainment
Sulfates	Attainment
H ₂ S	Unclassified
Lead ¹	Attainment

Source: CARB 2022a Notes: ¹ Only Los Angeles County portion of SCAB is in nonattainment for lead. Attainment means the SCAB meets the ambient air standards, Nonattainment means the SCAB does not meet the ambient air standards.

The SCAQMD, along with CARB, operates an air quality monitoring network that provides information on average concentrations of those pollutants for which Federal or State agencies have established NAAQS and CAAQS, respectively. The monitoring stations in the South Los Angeles County Coastal are depicted in Figure 3.3-1.

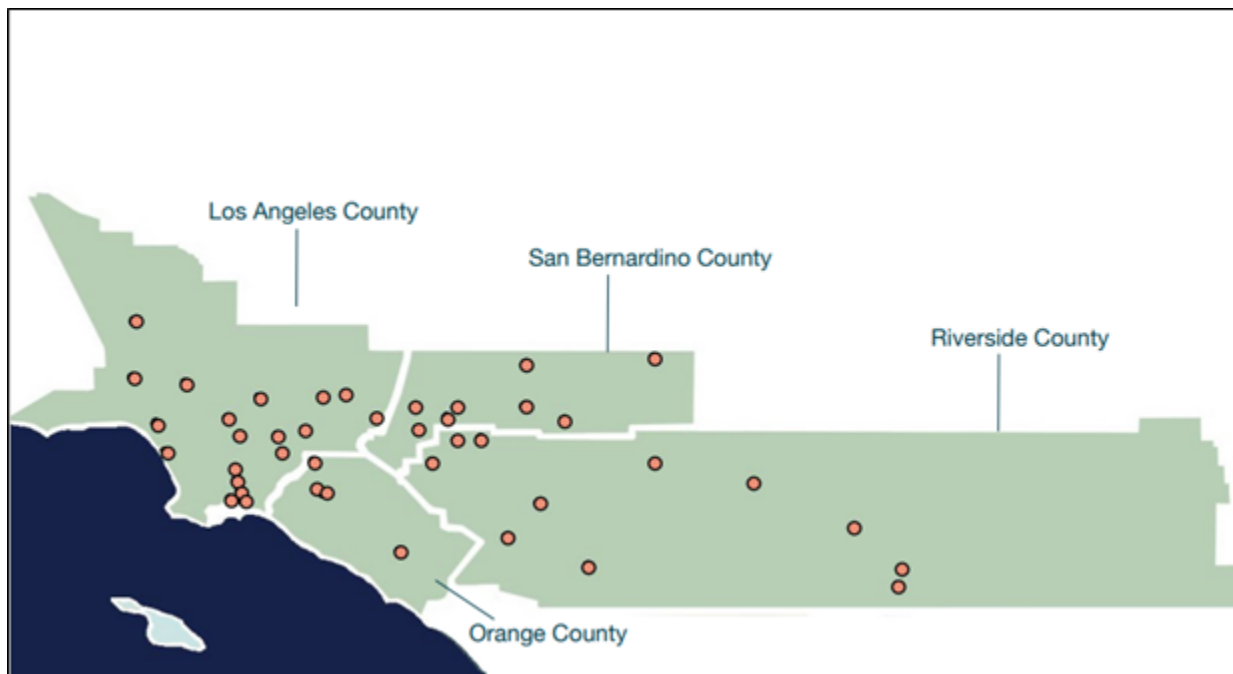


Figure 3.3-1: SCAQMD Monitoring Network

3.3.1.3 Regional Air Quality

Air quality in the SCAB is monitored by the SCAQMD, which operates a network of 38 permanent air monitoring stations and four single-pollutant source impact lead air monitoring sites throughout the SCAQMD jurisdiction (SCAQMD 2022c). For the purposes of background data and this air quality analysis, this analysis relied on data collected in the last three years for the California Air Resources Board (CARB) monitoring stations that are located in the closest proximity to the project site. Table 3.3-3 provides the background concentrations for O₃, PM₁₀, PM_{2.5}, CO, NO₂, SO₂, and Pb. Information is provided for monitoring stations South Coastal Los Angeles County 1, 2, 3 & 4 (station #072, 077, 033 & 039).

Table 3.3-3: Existing Ambient Air Quality Monitoring Station in Project Area

Pollutant and Monitoring Station Location	Maximum Concentration			Days Exceeding Standard		
	2019	2020	2021	2019	2020	2021
O₃ – 1-hour CAAQS (0.09 ppm)						
Long Beach – Signal Hill	*	0.105	0.086	*	4	0
Long Beach – 2425 Webster Street	0.075	*	*	0	*	*
Compton – 700 North Bullis Road	0.100	0.152	0.085	1	3	0
O₃ – 8-hour CAAQS (0.07 ppm)						
Long Beach – Signal Hill	*	0.083	0.065	*	4	0
Long Beach – 2425 Webster Street	0.065	*	*	0	*	*
Compton – 700 North Bullis Road	0.079	0.115	0.077	1	4	1
O₃ – 8-hour NAAQS (0.070 ppm)						
Long Beach – Signal Hill	*	0.083	0.064	*	4	0
Long Beach – 2425 Webster Street	0.064	*	*	0	*	*
Compton – 700 North Bullis Road	0.079	0.115	0.076	1	4	1
PM₁₀ – 24-hour CAAQS (50 µg/m³)						
South Long Beach	73.8	68.7	49.7	2	3	0
Long Beach – 2425 Webster Street	155.4	61.4	*	4	3	*
PM₁₀ – 24-hour NAAQS (150 µg/m³)						
South Long Beach	72.7	68.3	48.7	0	0	0
Long Beach – 2425 Webster Street	155.8	61.6	*	1	0	*
PM_{2.5} - 24-hour NAAQS (35 µg/m³)						
South Long Beach	30.6	63.7	42.9	0	10	4
North Long Beach	28.0	66.0	41.2	0	4	1
Long Beach – Route 710 Near Road	36.7	65.7	84.6	1	12	7
CO - 8-Hour CAAQS & NAAQS (9.0 ppm)						
No data collected	--	--	--	--	--	--
NO₂ - 1-Hour CAAQS (0.18 ppm)						
Long Beach – Signal Hill	*	0.075	0.059	*	0	0
Long Beach – 2425 Webster Street	0.071	*	*	0	*	*
Long Beach – Route 710 Near Road	0.097	0.100	0.091	0	0	0
NO₂ - 1-Hour NAAQS (0.10 ppm)						
Long Beach – Signal Hill	*	0.075	0.059	*	0	0
Long Beach – 2425 Webster Street	0.072	*	*	0	*	*

Pollutant and Monitoring Station Location	Maximum Concentration			Days Exceeding Standard		
	2019	2020	2021	2019	2020	2021
Long Beach – Route 710 Near Road	0.098	0.100	0.092	0	0	0
SO₂ – 24-hour Concentration - CAAQS (0.04 ppm) & NAAQS (0.14 ppm)						
No data collected	--	--	--	--	--	--
Pb - Maximum 30-Day Concentration CAAQS (1500 ng/m³)						
Los Angeles – North Main Street	20.5	8.6	*	*	*	*

Source: CARB 2023a

Notes: ppm= parts per million, µg/m³ – micrograms per cubic meter

* There was insufficient (or no) data available to determine the value.

The following is a description of criteria air pollutants, typical sources and health effects and the recently documented pollutant levels in the Project vicinity.

3.3.1.3.1 Ozone (O₃)

The most severe air quality problem in Los Angeles County is high concentrations of O₃. High levels of O₃ cause eye irritation and can impair respiratory functions. High levels of O₃ can also affect plants and materials. Grapes, lettuce, spinach and many types of garden flowers and shrubs are particularly vulnerable to O₃ damage. O₃ is not emitted directly into the atmosphere but is a secondary pollutant produced through photochemical reactions involving hydrocarbons and nitrogen oxides (NO_x). Significant O₃ generation requires about one to three hours in a stable atmosphere with strong sunlight. For this reason, the months of April through October comprise the "ozone season" in southern California. O₃ is a regional pollutant because O₃ precursors are transported and diffused by wind concurrently with the reaction process. The data contained in Table 3.3-3 shows that the Signal Hill area exceeded the 1-hour average ambient O₃ CAAQS and the 8-hour average ambient O₃ NAAQS and CAAQS during 2019 through 2021.

3.3.1.3.2 Suspended Particulate Matter (PM₁₀ and PM_{2.5})

Both State and Federal particulate standards now apply to particulates under 10 microns (PM₁₀) rather than to total suspended particulate, which includes particulates up to 30 microns in diameter. Continuing studies have shown that the smaller-diameter fraction of total suspended particulate represents the greatest health hazard posed by the pollutant; therefore, USEPA has recently established NAAQS for PM_{2.5}. The Project area is classified as nonattainment for both PM₁₀ and PM_{2.5} for CAAQS.

Particulate matter consists of particles in the atmosphere resulting from many kinds of dust and fume-producing industrial and agricultural operations, from combustion, and from atmospheric photochemical reactions. Natural activities also increase the level of particulates in the

atmosphere; wind-raised dust and ocean spray are two sources of naturally occurring particulates. The largest sources of PM₁₀ and PM_{2.5} in Los Angeles County are vehicle movement over paved and unpaved roads, demolition and construction activities, and unplanned fires. PM₁₀ and PM_{2.5} are considered regional pollutants with elevated levels typically occurring over a wide geographic area. Concentrations tend to be highest in the winter, during periods of high atmospheric stability and low wind speed. In the respiratory tract, very small particles of certain substances may produce injury by themselves or may contain absorbed gases that are injurious. Particulates of aerosol size suspended in the air can both scatter and absorb sunlight, producing haze and reducing visibility. They can also cause a wide range of damage to materials.

Table 3.2-3 shows that PM₁₀ levels regularly exceeded the CAAQS at all the monitoring stations during 2019 and 2020, and the NAAQS was exceeded once at one monitoring station in 2019. On the other hand, as indicated in Table 3.3-3, the PM_{2.5} NAAQS was exceeded during the 2019 through 2021 period. Similar levels can be expected to occur in the vicinity of the Project site.

3.3.1.3.3 Carbon Monoxide (CO)

Ambient CO concentrations normally correspond closely to the spatial and temporal distributions of vehicular traffic. Relatively high concentrations of CO would be expected along heavily traveled roads and near busy intersections. Wind speed and atmospheric mixing also influence CO concentrations; however, under inversion conditions, CO concentrations may be more uniformly distributed over a broad area.

Internal combustion engines, principally in vehicles, produce CO due to incomplete fuel combustion. Various industrial processes also produce CO emissions through incomplete combustion. Gasoline-powered motor vehicles are typically the major source of this contaminant. CO does not irritate the respiratory tract but passes through the lungs directly into the blood stream, and by interfering with the transfer of fresh oxygen to the blood, deprives sensitive tissues of oxygen, thereby aggravate cardiovascular disease, causing fatigue, headaches, and dizziness. CO is not known to have adverse effects on vegetation, visibility, or materials. None of the CARB monitoring stations reported CO data, as shown in Table 3.3-3.

3.3.1.3.4 Nitrogen Dioxide (NO₂) and Hydrocarbons

Los Angeles County has been designated as an attainment area for the NAAQS for NO₂. NO₂ is the "whiskey brown" colored gas readily visible during periods of heavy air pollution. Mobile sources and oil and gas production account for nearly all of the County's NO_x emissions, most of which is emitted as NO₂. Combustion in motor vehicle engines, power plants, refineries and other industrial operations are the primary sources in the region. Railroads and aircraft are other potentially significant sources of combustion air contaminants. Oxides of nitrogen are direct participants in photochemical smog reactions. The emitted compound, nitric oxide, combines with oxygen in the atmosphere in the presence of hydrocarbons and sunlight to form

NO₂ and O₃. NO₂, the most significant of these pollutants, can color the atmosphere at concentrations as low as 0.5 ppm on days of 10-mile visibility. NO_x is an important air pollutant in the region because it is a primary receptor of ultraviolet light, which initiates the reactions producing photochemical smog. It also reacts in the air to form nitrate particulates.

Motor vehicles are the major source of reactive hydrocarbons in the SCAB (approximately 82 percent of emissions (SCAQMD 2022c). Other sources include evaporation of organic solvents and petroleum production (less than one percent) and refining operations (slightly more than five percent) (SCAQMD 2022c). Certain hydrocarbons can damage plants by inhibiting growth and by causing flowers and leaves to fall. Levels of hydrocarbons currently measured in urban areas are not known to cause adverse effects in humans. However, certain members of this contaminant group are important components in the reactions, which produce photochemical oxidants.

Table 3.3-3 shows that the Federal and State NO₂ standards have not been exceeded at South Los Angeles County monitoring stations over the three-year period. Please note that the hydrocarbons were not monitored.

3.3.1.3.5 Sulfur Dioxide (SO₂)

Los Angeles County has been designated as an attainment area for the NAAQS for SO₂. SO₂ is the primary combustion product of sulfur, or sulfur containing fuels. Fuel combustion is the major source of this pollutant, while chemical plants, sulfur recovery plants, and metal processing facilities are minor contributors. Petroleum production is a negligible contributor. Gaseous fuels (natural gas, propane, etc.) typically have lower percentages of sulfur containing compounds than liquid fuels such as diesel or crude oil. SO₂ levels are generally higher in the winter months. Decreasing levels of SO₂ in the atmosphere reflect the use of natural gas in power plants and boilers.

At high concentrations, SO₂ irritates the upper respiratory tract. At lower concentrations, when respirated in combination with particulates, SO₂ can result in greater harm by injuring lung tissues. Sulfur oxides (SO_x), in combination with moisture and oxygen, results in the formation of sulfuric acid, which can yellow the leaves of plants, dissolve marble, and oxidize iron and steel. SO_x can also react to produce sulfates that reduce visibility and sunlight. Table 3.3-3 shows no data has been reported over the three-year period in any of the monitoring stations.

3.3.1.3.6 Lead (Pb) and Suspended Sulfate

Ambient Pb levels have dropped dramatically due to the increase in the percentage of motor vehicles that run exclusively on unleaded fuel. Ambient Pb levels in Los Angeles County are well below the ambient standard and are expected to continue to decline; the data reported in Table 3.3-3 only shows the highest concentration as the number of days exceeding standards are not reported. Suspended sulfate levels have stabilized to the point where no excesses of the

State standard are expected in any given year. Petroleum production operations do not emit Pb.

3.3.1.4 Toxic Air Contaminants

Health and Safety Code (HSC) Section 39655 defines a TAC as an air pollutant which may cause or contribute to an increase in mortality, an increase in serious illness, or which may pose a present or potential hazard to human health. USEPA defines hazardous air pollutants (HAPs) as those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Under California's TAC programs (AB 1807, HSC Section 39650 et seq. and AB 2588, HSC Section 39650 et seq), CARB, with the participation of the local air pollution control districts, evaluates and develops any needed control measures for air toxics to limit exposure to TACs to the maximum extent feasible.

Office of Environmental Health Hazard Assessment (OEHHA) has determined that long-term exposure to diesel particulate matter (DPM) poses the highest cancer risk of any toxic air contaminants (TAC) it has evaluated. Short-term exposure to diesel exhaust can also have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, DPM made people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen. Short-term exposure to diesel exhaust also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. The impacts of the Project related to DPM is provided below in Section 3.3.3, Impact Analysis.

Monitoring for TACs is limited compared to monitoring for criteria pollutants because toxic pollutant impacts are typically more localized than criteria pollutant impacts. CARB conducts air monitoring for a number of TACs every 12 days at approximately 20 sites throughout California. The City of Signal Hill and SHP's drill sites are located closest to the North Long Beach and North Los Angeles monitoring stations. Table 3.3-4 presents a summary of the most current available TAC data from the North Long Beach station (ARB# 70072), located at 3648 N. Long Beach Blvd., Long Beach, CA 90807 (approximately 4.5 miles northwest of the facility), and the Los Angeles – North Main Street station (ARB# 70087), located at 1630 North Main St., Los Angeles, CA 90012 (approximately 23 miles northwest of the facility). These monitoring stations are the closest to the drill sites that report all the applicable TACs and show the best available representative pollutant concentrations.

Table 3.3-4. Ambient Air Quality TACs –Most Recent Maximum Concentration¹

Pollutant	Peak 24-hour Concentration			
	ARB# 70072	Year	ARB# 70087	Year
VOCs	ppbv		ppbv	
Acetaldehyde	1.8	2013	2.6	2019
Acetone	8.3	2013	14	2019
Acetonitrile	0.8	2013	0.4	2019
Acrolein	1.1	2013	1.8	2019
Benzene	0.82	2013	0.58	2019
1,3-Butadiene	0.29	2013	0.11	2019
Carbon Disulfide	0.05	2006	2.9	2006
Carbon Tetrachloride	0.09	2013	0.08	2019
Chlorobenzene	0.05	1994	0.1	1994
Chloroform	0.05	2013	0.3	2019
meta-Dichlorobenzene	0.1	1994	0.1	1994
ortho-Dichlorobenzene	0.15	2007	0.15	2007
para-Dichlorobenzene	0.15	2007	0.15	2007
Dichlorodifluoromethane	--	--	--	--
cis-1,3-Dichloropropene	0.05	2013	0.05	2019
trans-1,3-Dichloropropene	0.05	2013	0.05	2019
Ethyl Benzene	0.3	2013	0.3	2019
Ethylene Dibromide	0.005	1994	0.005	1994
Ethylene Dichloride	0.1	1992	0.1	1992
Formaldehyde	3.8	2013	7.3	2019
Methyl Bromide	0.05	2013	0.015	2019
Methyl Chloroform	0.005	2013	0.005	2019
Methyl Ethyl Ketone	0.3	2013	0.5	2019
Methyl tertiary-Butyl Ether	0.15	2004	0.15	2004
Methylene Chloride	2.6	2013	3.5	2019
Perchloroethylene	0.06	2013	0.04	2019
Styrene	0.1	2013	0.3	2019
Toluene	1.7	2013	6.2	2019
Trichloroethylene	0.08	2013	0.03	2019
Trichlorofluoromethane	--	--	--	--
Trichlorotrifluoroethane	--	--	0.01	2019
meta-Xylene	2.2	1994	6.7	1994
meta/para-Xylene	1.1	2013	0.9	2019
ortho-Xylene	0.4	2013	0.3	2019
para-Xylene	0.9	1994	2.4	1994
Polycyclic Aromatic Hydrocarbons	ng/m ³	Year	ng/m ³	Year
Benzo(a)pyrene-10	0.61	2004	0.40	2004
Benzo(b)fluoranthene-10	0.51	2004	0.41	2004
Benzo(g,h,i)perylene-10	1.7	2004	1.1	2004
Benzo(k)fluoranthene-10	0.19	2004	0.15	2004
Dibenz(a,h)anthracene-10	0.18	2004	0.025	2004
Indeno(1,2,3-cd)pyrene-10	0.64	2004	0.46	2004

Pollutant	Peak 24-hour Concentration			
	ARB# 70072	Year	ARB# 70087	Year
VOCs	ppbv		ppbv	
Metals	ng/m ³	Year	ng/m ³	Year
Aluminum	1,700	2003	2,400	2003
Antimony	12	2013	17	2019
Arsenic	0.75	2013	0.87	2019
Barium	56	2003	95	2003
Beryllium	0.3	2013	0.152	2019
Bromine	9	2003	9	2003
Cadmium	0.75	2013	0.65	2019
Calcium	2,300	2003	2,800	2003
Chlorine	3,900	1990	4,200	1990
Chromium	9	2013	19	2019
Cobalt	0.75	2013	1.9	2019
Copper	46	2013	95	2019
Hexavalent Chromium	0.07	2013	0.11	2019
Iron	1,400	2013	2,690	2019
Lead	9.1	2013	20.5	2019
Manganese	30	2013	46.9	2019
Mercury	1.5	2003	4	2003
Molybdenum	5.4	2013	6.9	2019
Nickel	5	2013	7	2019
Phosphorus	35	2003	32	2003
Potassium	890	2003	890	2003
Platinum	0.15	2013	0.105	2014
Rubidium	4	2003	5	2003
Selenium	0.75	2013	1.65	2019
Silicon	5,600	2003	7,500	2003
Strontium	14	2013	25	2019
Sulfur	2,300	2013	1,600	2013
Tin	5.4	2013	15.4	2019
Titanium	87	2013	125	2019
Uranium	1.5	2003	1.5	2003
Vanadium	12	2013	4.3	2019
Yttrium	2	2003	3	2003
Zinc	90	2013	147	2019
Zirconium	4.3	2013	10.6	2019

Source: CARB 2023b. Annual Toxics Summaries by Monitoring Site, North Long Beach.

Notes: ¹ There are no air quality standards for TACs.

ppbv = parts per billion by volume. ng/m³ = nanograms per cubic meter. -- = no data available in the last 6 years.

The selection of these monitoring stations was based on the proximity of the monitoring station to the proposed Project location, land-use of the area, and representativeness and availability of the data.

3.3.1.4.1 MATES IV and V

The Multiple Air Toxics Exposure Study (MATES) IV and MATES V report the monitored and modeled concentrations of air toxics and estimated the carcinogenic risks from ambient levels of air toxics. Chronic non-cancer health impacts were also estimated from the monitoring data, and MATES V includes an exploratory analysis of chronic non-cancer health impacts (e.g., cardiovascular, respiratory, neurological health outcomes, etc.). The chronic non-cancer health impacts, typically expressed as a hazard index, is an indicator of whether non-cancer health effects can occur due to long-term exposure to TACs. A hazard index that is less than or equal to one indicates that chronic non-cancer health effects are not likely to occur over a lifetime of exposure. Annual average concentrations were used to estimate a lifetime risk from exposure to these levels, consistent with guidelines established by the OEHHA of the California Environmental Protection Agency (CalEPA). Given the generally decreasing air pollution levels in the region, ambient concentrations of some pollutants can sometimes be lower than what air quality monitoring instruments can detect. Therefore, statistical techniques are required to calculate average concentrations and provide an estimate of actual levels. Modern statistical techniques were used to analyze the MATES V data and to provide the MATES V study's comprehensive comparison of pollutant trends. MATES II, MATES III, and MATES IV measurements were also re-analyzed as part of MATES V using these same techniques.

In addition to new measurements and updated modeling results, several other key updates were implemented in MATES V. First, MATES V estimates cancer risks by taking into account multiple exposure pathways, including both inhalation and non-inhalation pathways, which includes soil exposure. Exposure from non-inhalation pathways results from substances that deposit on the ground in particulate form and contribute to risk through the ingestion of soil or homegrown crops, or through dermal absorption. Utilizing this multiple exposure pathways approach is consistent with how cancer risks are estimated under SCAQMD's programs such as permitting, Air Toxics Hot Spots (AB 2588), and CEQA compliance. Second, along with cancer risk estimates, MATES V also includes information on the chronic non-cancer health impacts from inhalation and non-inhalation pathways.

Air toxics monitoring data collected at ten fixed site monitoring locations shows that the levels of air toxics in the SCAB continue to decline, including the Long Beach site (located less than a mile away from SHP). The following key findings from MATES V include:

- MATES V found a 40% decrease in risk since MATES IV and an 84% decrease since MATES II. The estimated population wide population-weighted cancer risk calculated from the modeling data (as opposed to fixed site monitoring data) similarly found a 54% decrease since MATES IV.
- MATES V determined that diesel PM is the largest contributor to overall air toxics cancer risk. However, monitoring data showed that the average levels of diesel PM in MATES V are 53%

lower at the 10 fixed site monitoring locations as compared to MATES IV and 86% lower as compared to MATES II.

- The main sources of cancer risk in the SCAB are neither lead nor arsenic. Most monitoring sites indicated that concentrations of lead and arsenic also continued an overall downward trend in MATES V as compared to MATES IV.

3.3.1.5 Sensitive Receptors

CARB has identified the following groups who are most likely to be affected by air pollution: children less than 14 years of age, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. According to the SCAQMD, sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Drill Site #1 is surrounded by retail with some residences to the west. Drill Sites #2 and #3 are surrounded by commercial and industrial uses. Drill Site #4 is surrounded by commercial land uses with residences further south. Drill Site #5 is surrounded by residential and retail land uses. Drill Site #6 is surrounded by residential neighborhoods to the north and various commercial land uses to the south, east, and west. Drill Site #7 is surrounded by various commercial uses. Note that many of the properties/land uses adjacent to the drill sites are either owned by SHP and leased out to various residential, commercial, or industrial tenants, or were previously owned by SHP and sold for redevelopment. The closest residential property line boundary to a drill site is located 25 feet to the east of Drill Site #5. Table 3.3-5 summarizes the closest residence, school, and hospital to each drill site.

Table 3.3-5: Nearest Residents, School and Hospital to the Fenceline of Each Drill Site

Drill Site	Distance to Nearest Residence ¹ (feet)	Distance to Nearest School (feet)	Distance to Nearest Hospital (feet)
1	860	1,989	1,417
2	1,350	1,994	2,599
3	680	2,676	4,415
4	500	2,579	6,431
5	25	2,090	6,589
6	85	1,361	2,699
7	310	1,497	2,575

Notes:

¹ Distance from the nearest residence parcel boundary to a CUP Site boundary.

3.3.1.6 Existing Operations

SHP maintains various SCAQMD permits for applicable facilities within the West Unit (Drill Sites #1, #2, and #3), Central Unit (Drill Sites #4 and #5), and East Unit (Drill Sites #6 and #7), and they are subject to the Annual Emissions Reporting requirements (see Section 3.3.2.3 for SCAQMD rules that apply to current operations at the SHP facilities). SHP also voluntarily conducts fence line air emissions monitoring at their West Unit (Drill Site #2) facility.

As discussed in Section 2, Project Description, the Project includes the continuance of SHP’s existing consolidated oil and gas operations at the seven drill sites covered under CUP 97-03 for the proposed 20-year CUP 97-03 extension term. Table 3.3-6 summarizes the various existing emissions sources specific to each individual drill site, as well as mobile sources, which currently services all of the drill sites and are not specific to one site/location.

Table 3.3-6: Existing Emission Sources for Drill Sites

Drill Site	Fugitive Emissions	Tank Emissions	Stationary Sources	Mobile Sources
Drill Site #1	one existing well cellar, three active well heads, one idle well head	None	None	None
Drill Site #2	one well cellar, four active well heads, four idle well heads	three crude oil tanks, two water tanks, two surge tanks, two free water knockout tanks, two natural gas liquid vessels	one gas membrane, one low temperature gas separation (LTS) unit, one Wemco, one turbine engine with selective catalytic reduction (SCR), various combustion equipment on an as-needed basis	None
Drill Site #3	one well cellar, four active well heads, three idle well heads	None	None	None
Drill Site #4	one well cellar, eight active well heads, no idle well heads	None	None	None
Drill Site #5	one well cellar, one active well head, five idle well heads	four crude oil tanks, four water tanks, three free water knock outs, two diesel storage tanks	various combustion equipment on an as needed basis	None
Drill Site #6	two active well heads, no idle well heads	None	None	None
Drill Site #7	one well cellar, one active well	None	None	None

Drill Site	Fugitive Emissions	Tank Emissions	Stationary Sources	Mobile Sources
	head, no idle well heads			
All Drill Sites	--	--	--	on-road vehicles, off-road equipment, etc.

Table 3.3-7 describes the calculation methods used for each type of emissions source. Project emissions estimates can be found in Appendix D.

Table 3.3-7: Operations Estimation Method by Emission Source

Emission Source	Estimation Method	Source
Fugitive	Fugitive emissions from the well components for all drill sites were calculated based on the component counts provided by Montrose for SHP and the weighted average emission factor for each component type. Emission factors per component type were pulled from SHP’s annual emissions reporting (AER) to SCAQMD through the AER portal. Since the emission factors components reported in the AER portal varied depending on the process and the component service type (e.g., gas service, light liquid service, etc.), a weighted average of each emission factor by the number of components in that process was used. For components with different service types, the gas service weighted average emission factor was used as a conservative estimate. Existing well cellar emissions and active well head emissions were primarily calculated based on the default emission factor as reported in the AER. VOC emissions from well cellars were calculated using the default AER reported emission rate with a 0.5 adjustment factor. SCAQMD Rule 1148.1 stringently restricts the storage of organic liquids in the well cellars to less than 24 hours. Because of the requirements of Rule 1148.1, assuming that the well cellars are wet and have organic liquids 50% of the time, 0.5 is an appropriate adjustment to the default AER emission factor.	SHP AER reporting to SCAQMD, 2022
Tank	Emissions from the tanks, vessels, turbine, and combustion equipment were calculated based on the average reported emissions from the AER portal from 2013 through 2021.	SHP AER reporting to SCAQMD, 2022
Stationary	Turbine NO emissions were provided separately by SHP for 2010 through 2021 and are based on continuous emissions monitoring systems (CEMS) data. All other emissions were calculated based on the average reported emissions from the AER portal from 2013 through 2021.	SHP CEMS data SHP AER reporting to SCAQMD, 2022
Mobile	Emissions from existing mobile sources were estimated using the vehicle activity and travel distance data described in the Transportation Memorandum (Sespe 2022; Appendix I) prepared for the Project. The transportation data is generally representative of the complete roundtrips, or “tours,” that a single vehicle would make on a given operational day. Specifically, the average roundtrip distances (miles) represent the full distance that each vehicle would travel in a given day, moving from SHP’s main office and between the individual drill sites. For existing conditions, there is an estimated 26 round trips per day	EMFAC 2021, CARB 2022

Emission Source	Estimation Method	Source
	made by various light-duty vehicles and trucks. The emissions from these existing mobile source activities were estimated by vehicle type using latest EMFAC2021 emission rates (CARB 2022e). An average of LDT1 (light duty truck) and LDT2 emission factors was used to represent employee trip emissions, and T7 Single Other Class 8 emission factors were used to represent general heavy duty truck trip activities.	

3.3.1.6.1 Baseline Criteria Pollutant Emissions

Since the Project includes the long-term continued operations of the drill sites, the baseline emissions and related health effects are used to characterize the expected emissions for continuing operations. As such, continuing operations emissions have been quantified and compared to regulatory thresholds to evaluate if additional mitigation measures (i.e., CUP conditions) are necessary to ensure impacts are less than significant for the continued operation of the existing facilities (as described in the methods of analysis in Section 3.1). Specifically, baseline emissions representative of continuing operations for the drill sites current operations were calculated as described above for the following:

- Well servicing and maintenance;
- Oil processing, storage and transfer;
- Natural gas and natural gas liquids processing, storage and transfer;
- Produced water separation, and injection facilities; and
- Electrical production from a natural gas turbine powered generator.

Table 3.3-8 summarizes the vehicle trips from existing operations. Accordingly, mobile source emissions were also quantified for SHP’s existing truck activities. EMFAC2021 emission factors were used to quantify the emissions from mobile sources (i.e., on-road vehicles). Table 3.3-9 presents the criteria emissions for SHP’s current operations compared to the operational (long-term) emissions thresholds (refer to Section 3.3.3.1.1 for detailed emissions thresholds as established by the SCAQMD). Criteria emissions were estimated using appropriate emission factors from the California Emissions Estimator Model (CalEEMod) version 2020.4.0 (California Air Pollution Control Officers Association [CAPCOA] 2021), which is the most current version of the model approved for use by the South Coast Air Quality Management District (South Coast AQMD), and emission factors from annual emissions data reported to SCAQMD through the Annual Emissions Reporting (AER) portal.

Table 3.3-8: Existing Mobile Emission Sources for Drill Sites

Activity/Operation	Average Trips/Day	Average Travel Distance (miles)
Operations Surveillance	2	7
Plant Operations (Drill Sites #2 and #5)	2	5
Surface Equipment Maintenance & Repairs	6	7
Downhole Well Servicing/Repairs	2	6.5
Misc. Maintenance & Site Visitors	2	7
Drilling/Redrilling Operations - Employees & Contractors	8	5
General Heavy-Duty Truck Activity	4	5

Table 3.3-9: Existing Emission Sources for Drill Sites

Emissions Source	ROG (lb/day)	NO _x (lb/day)	CO (lb/day)	SO _x (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)
Drill Site #1	2.30	NA	NA	NA	NA	NA
Drill Site #2	15.64	24.55	15.06	1.03	8.42	NA
Drill Site #3	4.40	NA	NA	NA	NA	NA
Drill Site #4	5.00	NA	NA	NA	NA	NA
Drill Site #5	10.71	NA	NA	NA	NA	NA
Drill Site #6	0.07	NA	NA	NA	NA	NA
Drill Site #7	0.19	NA	NA	NA	NA	NA
Mobile Sources	0.04	0.18	0.21	0.00	0.03	0.03
Total Daily Emissions	38.35	24.73	15.28	1.03	8.45	0.03
SCAQMD Significance Threshold	55	55	550	150	150	55
Threshold Exceeded for a Single Year?	NO	NO	NO	NO	NO	NO

Refer to Appendix D for detailed analysis of existing emissions.

Note: 0.00 could represent < 0.00

3.3.1.6.2 Baseline Health Risk Assessment

For the emissions sources identified in Section 3.3.1.6.1 SCAQMD Rule 1402 applies to facilities, including SHP’s drill sites, which are subject to the Air Toxics “Hot Spots” Information and Assessment Act (AB 2588), and facilities with emissions that exceed significant or action risk levels. This rule seeks to reduce the health risk associated with emissions of TACs from existing sources by specifying limits for the Maximum Individual Cancer Risk (MICR), cancer burden, and non-cancer acute and chronic Hazard Index (HI) and requiring facilities to implement risk reduction plans to achieve these risk limits, as required by the Hot Spots Act and this rule. Rule

1402 requires preparation of a Health Risk Assessment (HRA) to demonstrate compliance with specified limits.

The SCAQMD has set the level of significance for carcinogenic risk at ten in one million, which is understood as the possibility of causing ten additional cancer cases in a population of one million people. The level of significance for chronic and acute non-cancer risk is a hazard index of 1.0 (note that the SCAQMD thresholds for Rule 1402 are identical to those adopted in AB 2588). Baseline health risks, representative of health risks for continuing operations, were calculated for the emissions sources identified in Section 3.3.1.6.1 above (refer also to Appendix D for methodologies used for the development of the HRA). The results of the baseline HRA analysis are presented below in Tables 3.3-10 through 3.3-12. All existing operations are below SCAQMD’s health risk thresholds, and therefore continuing operations are expected to be below SCAQMD’s health risk thresholds.

Table 3.3-10: Baseline Cancer Health Risk Impacts Predicted by HARP2

Category	Maximum Exposed Individual Resident (MEIR)	Maximum Exposed Individual Worker (MEIW)
Baseline	4.42 in a million	0.74 in a million
Threshold	10 in a million	10 in a million
Exceeds Threshold?	No	No

Refer to Appendix D for detailed analysis of existing health risk impacts.

Table 3.3-11: Baseline Non-Cancer Chronic Impacts Predicted by HARP2

Category	Maximum Exposed Individual Resident (MEIR)	Maximum Exposed Individual Worker (MEIW)
Baseline	0.02	0.02
Threshold	1.0	1.0
Exceeds Threshold?	No	No

Refer to Appendix D for detailed analysis of existing health risk impacts.

Table 3.3-12: Baseline Non-Cancer Acute Impacts Predicted by HARP2

Category	Maximum Exposed Individual Resident (MEIR)	Maximum Exposed Individual Worker (MEIW)
Baseline	0.01	0.01
Threshold	1.0	1.0
Exceeds Threshold?	No	No

Refer to Appendix D for detailed analysis of existing health risk impacts.

3.3.2 Regulatory Setting

3.3.2.1 Federal

3.3.2.1.1 Clean Air Act

The USEPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside of state waters (Outer Continental Shelf). USEPA is responsible for implementing the CAA, which is the comprehensive federal law that regulates air emissions from stationary and mobile sources.

The CAA is designed to attain compliance with the NAAQS adopted by the USEPA (42 United States Code (U.S.C.) §7409). USEPA has adopted NAAQS for ozone, CO, NO₂, SO₂, PM₁₀, PM_{2.5}. (40 CFR Part 50). For planning purposes, USEPA has divided the country into separate "air quality control regions" (42 U.S.C. §7407; 40 CFR Part 81). USEPA must determine whether each air quality region is in "attainment" or "nonattainment" of the NAAQS for each criteria pollutant (42 U.S.C. §7407(d)(4); 42 U.S.C. §7501(2)). Once a region is designated as in nonattainment, the CAA requires states to prepare a "state implementation plan" (SIP) (42 U.S.C. §7410). Each SIP must provide for: (1) "implementation of all reasonably available control measures as expeditiously as practicable," and (2) the attainment of the NAAQS. USEPA must review and approve each proposed SIP (42 U.S.C. §7410(a)(1)).

The SCAB is an air quality control region under the CAA. The SCAQMD is responsible for preparing the SCAB's "Air Quality Management Plan" (AQMP) (Health and Safety Code §40408). The AQMP serves as the SIP under the CAA (Health and Safety Code §40460). The AQMP sets forth a variety of general "control measures" designed to attain and maintain the NAAQS within the SCAB (Health and Safety Code §40913).

The CAA is organized into seven main sections:

- Title I – Air Pollution Prevention and Control
 - Part A – Air Quality and Emission Limitations
 - Part B – Ozone Protection
 - Part C – Prevention of Significant Deterioration (PSD) of Air Quality
 - Part D – Plan Requirements for Nonattainment Areas
- Title II – Emission Standards for Moving Sources
 - Part A – Motor Vehicle Emission and Fuel Standards
 - Part B – Aircraft Emission Standards
 - Part C – Clean Fuel Vehicles
- Title III – General Provisions

- Title IV – Noise Pollution
- Title IV-A – Acid Deposition Control
- Title V – Permits
- Title VI – Stratospheric Ozone Protection

Title I Part C of the CAA is Prevention of Significant Deterioration (PSD), which applies to new major sources or major modifications at existing sources for pollutants where the area that the source is located in is in attainment or unclassifiable with the NAAQS. It requires installation of the “Best Available Control Technology” (BACT), an air quality analysis, an additional impacts analysis, and public involvement. PSD review will not be required for the proposed Project, because it does not constitute a new major source or major modification to an existing source (physical change to existing equipment). Title III of the CAA regulates TACs and is applicable to the proposed Project as analyzed in Chapter 4. Title V of the CAA establishes a federal permit program. The Title V program is implemented by the SCAQMD for areas within its jurisdiction via SCAQMD Regulation XXX – Title V Permits. Title V permits incorporate all federally enforceable requirements as well as state and local requirements.

SHP’s drill sites have and would continue to operate pursuant to SHP’s SCAQMD air permits, which imposes all applicable CAA requirements on the oil and gas operations conducted under CUP 97-03.

3.3.2.2 State

3.3.2.2.1 CAAQS

The California Clean Air Act sets forth a state regulatory program that is parallel to the federal CAA program. The California CAA is designed to attain compliance with the CAAQS within specified “air quality basins” (HSC §39606). CARB has adopted CAAQS for all pollutants for which the federal government has NAAQS, and has also established standards for sulfates, visibility, H₂S, and vinyl chloride. California standards are generally more stringent than the NAAQS. Federal and state air quality standards are presented in Table 3.2-1.

For the most part, CARB’s air quality basins have the same boundaries as USEPA’s air quality control regions. Like USEPA under the Federal CAA, CARB must determine whether each air quality basin is attainment or nonattainment of the CAAQS for each criteria pollutant (HSC §39608). An “attainment plan” must be prepared for each nonattainment region (HSC §40911). Like federal SIPs, attainment plans must demonstrate how nonattainment basins will achieve and maintain the CAAQS (HSC §40913). Within each region/basin, the same document generally serves as both the SIP and the attainment plan (HSC §41650(a)). These plans are variously referred to as “air quality management plans”, “air quality maintenance plans”, “attainment plans”, or “non-attainment plans”. CARB must review and approve each attainment plan (Health and Safety Code §40911).

The SCAB is an air quality basin under the California CAA. The SCAQMD’s Air Quality Management Plan serves as the attainment plan under the California Act for the SCAB (HSC §40460). The Air Quality Management Plan sets forth a variety of general “control measures” designed to attain and maintain the CAAQS within the SCAB (HSC §40913). Thus, the Air Quality Management Plan serves the same purpose under the California CAA and the parallel CAA – it provides a blueprint for attaining compliance with both the NAAQS and the CAAQS. CARB, which became part of the CalEPA in 1991, is responsible for ensuring implementation of the California Clean Air Act and federal Clean Air Act, and for regulating emissions.

3.3.2.2.2 AB 617 Community Air Protection Program

On July 26, 2017, Governor Brown approved Assembly Bill No. 617 (“AB 617”). AB 617 added and amended various sections of the California Health and Safety Code. The intent of AB 617 is to develop a collaborative relationship between CARB and local air districts to facilitate community participation, provide a science-based foundation supporting the identification of communities with high cumulative exposure burdens, accelerate the development and use of advanced air monitoring methods and equipment, and support the use of new mobile and stationary source technology. To achieve those goals, AB 617 requires six significant measures: (1) Annual Reporting; (2) Best Available Retrofit Control Technology; (3) a Statewide Clearinghouse of Best Available Retrofit Control Technology; (4) Community Air Monitoring; (5) Community Emissions Reduction Programs; and (6) Increased Penalties.

The AB 617 Program’s focus is to reduce exposure in communities most impacted by air pollution. A central component of the program is the selection of specific communities in which the Community Air Monitoring and Community Emissions Reductions Programs take place. These communities are selected based on community exposure to air pollution. In 2018, the communities of Wilmington, Carson, and West Long Beach were nominated by SCAQMD and selected by CARB as an AB 617 Community. Drill Site #1 is within this community and therefore subject to the community programs. Further discussion is provided in Section 3.3.3.3.

3.3.2.2.3 AB 1807 and AB 2728

California also has established a state air toxics program, California Toxic Air Contaminants Program (Tanner Bill) (AB 1807), which was modified by the Revised Tanner Bill (AB 2728). This program sets forth provisions to implement the national program for control of HAPs.

SHP’s CUP Sites are subject to the requirements of the California state air toxics program.

3.3.2.2.4 AB 2588

The Air Toxic “Hot Spots” Information and Assessment Act (AB 2588), as amended by Senate Bill (SB) 1731, requires operators of certain stationary sources to inventory air toxic emissions from their operations and, if directed to do so by the local air district, prepare an HRA to determine the potential health impacts of such emissions. If the health impacts are determined to be

“significant” (greater than 10 per one million exposures or non-cancer hazard index greater than 1.0), each facility operator must, upon approval of the HRA, provide public notification to affected individuals.

SHP’s CUP Sites are subject to the requirements of AB 2588. The current status in the "Hot Spots" Program for all SHP facilities subject to AB 2588 (including those outside of the drill sites) is reported in the CARB’s Facility Search Engine. The SCAQMD uses this data to place each facility into high, intermediate, and low priority categories. When considering the ranking, the potency, toxicity, quantity, volume, and proximity of the facility to receptors are evaluated by an air district. Facilities with Prioritization Scores less than or equal to 1 are categorized as low priority, and facilities with scores greater than or equal to 10 are categorized as high priority, which are required to prepare site-specific health risk assessments. Corresponding to the assigned priority score, each facility is assigned a Program Status, such as: Code: A - Priority Score > 10; B - 10<Risk<50; C - 50<Risk<100; D - Risk > 100; E - Unprioritized; F - 1<Risk<10; G - exempt or out of business. The SHP CUP facilities have been assigned a Program Status of F (i.e., lowest risk) (CARB 2020).

3.3.2.2.5 [Proposition 65](#)

Proposition 65, officially named the “Safe Drinking Water and Toxic Enforcement Act of 1986,” became law in California in 1986. The Proposition was intended to protect California citizens and the State’s drinking water sources from chemicals known to cause cancer, birth defects, or other reproductive harm, and to inform citizens about exposure to such chemicals. Under the statute, the state must maintain and update a list of such chemicals. Additionally, a person doing business cannot expose an individual to such a chemical without first giving a clear and reasonable warning. The warning can be provided in various ways, such as by labeling a consumer product, posting signs at the workplace, or distributing or publishing notices. SHP is subject to the requirements of Proposition 65.

3.3.2.3 [Regional](#)

The SCAQMD has regulatory authority over stationary sources and air pollution control equipment, and limited authority over mobile sources for areas within its jurisdiction. The SCAQMD is responsible for air quality planning in the SCAB and the development of the Air Quality Management Plan. The Air Quality Management Plan establishes the strategies that will be used to achieve compliance with CAAQS in all areas within the SCAQMD’s jurisdiction.

The SCAQMD rules and regulations which are applicable to the existing and future operation of the SHP CUP sites, include but are not limited to the following:

- Rule 203 – Permit to Operate
- Rule 212 – Standards for Approving Permits
- Rule 218 – Continuous Emissions Monitoring

- Rule 222 – Filing Requirements for Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II
- Rule 301 – Permitting and Associated fees
- Rule 401 – Visible Emissions
- Rule 402 – Nuisance
- Rule 403 – Fugitive Dust
- Rule 404 – Particulate Emissions
- Rule 407 – Liquid and Gaseous Air Contaminants
- Rule 409 – Combustion Contaminants
- Rule 431.2 – Sulfur Content of Liquid Fuels
- Rule 463 – Organic Liquid Storage
- Rule 464 – Wastewater Separators
- Rule 1134 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities
- Rule 1148.1 – Oil and Gas Production Wells
- Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers
- Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil
- Rule 1173 – Control of Volatile Organic Compound leaks and Releases from Components at Petroleum Facilities and Chemical Plants
- Rule 1176 – VOC Emissions from Wastewater Systems
- Regulation XIII – NSR, including key rule (Rule 1303 – Requirements)
- Rule 1401 – New Source Review of Toxic Air Contaminants
- Rule 1402 – Control of Toxic Air Contaminants from Existing Sources
- Regulation XX – RECLAIM including key rules (Rule 2005 – NSR for RECLAIM Pollutants)
- Regulation XXX – Title V Permits (SHP has no Title V permits)

3.3.2.3.1 Rule 203

Rule 203 applies to facilities, including SHP's drill sites, that operate any equipment that may cause air contaminant emissions. This rule requires that the facility obtains a written permit to operate from the Executive Officer.

3.3.2.3.2 Rule 212

Rule 212 applies to facilities, including SHP's drill sites, that require a Permit to Operate. This rule sets the standards for approving permits to operate to ensure the facility eliminates, reduces, or controls air contaminant emissions.

3.3.2.3.3 Rule 218

Rule 218 applies to all facilities, including SHP's drill sites, that have emissions sources that require continuous emissions monitoring systems (CEMS). This rule sets the applicability and monitoring requirements of CEMS as well as application and approval requirements.

3.3.2.3.4 Rule 222

Rule 222 applies to facilities, including SHP's drill sites, not requiring a written permit pursuant to Regulation II for specific emission sources.

3.3.2.3.5 Rule 301

Rule 301 provides authority for the SCAQMD to adopt a fee schedule for the issuance of permits to cover the cost of evaluation, planning, inspection, and monitoring related to that activity.

3.3.2.3.6 Rule 401

Rule 401 applies to facilities, including SHP's drill sites, that have visible emissions. This rule requires that the facility will not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour that darker or of high opacity.

3.3.2.3.7 Rule 402

Rule 402 applies to facilities, including SHP's drill sites, that emit air contaminants. This rule requires that the facility will not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to the public.

3.3.2.3.8 Rule 403

Rule 403, Fugitive Dust, applies to any activity or man-made condition capable of generating fugitive dust, which includes SHP's drill sites. The purpose of this Rule is to reduce the amount of particulate matter entrained in ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions.

SHP follows SCAQMD's protocols for dust control. Drill Sites #2, #4, #5, #6 and #7 are all paved. Drill Site #1 has a stabilized gravel surface that controls dust. Drill Site #3 is partially covered

with gravel. Further, Drill Site #3 is sprayed by a mobile water truck as needed whenever there are heavy equipment operations (e.g., well servicing, drilling etc.) and light vehicle traffic on Drill Site #3 is speed controlled to minimize dust.

3.3.2.3.9 Rule 404

Rule 404 applies to facilities, including SHP's Drill Sites, that emit particulate matter. This rule aims to ensure there is not an excess of particulate matter emissions.

3.3.2.3.10 Rule 407

Rule 407 applies to facilities, including SHP's drill sites, which operate equipment that may discharge liquid and gaseous air contaminants. This rule sets specific standards for carbon monoxide and sulfur compounds emissions into the atmosphere.

3.3.2.3.11 Rule 409

Rule 409 applies to facilities, including SHP's drill sites, that generate contaminants from combustion processes. The rule sets requirements for the discharge limits of combustion contaminants from the burning of fuel.

3.3.2.3.12 Rule 431.2

Rule 431.2 applies to facilities, including SHP's drill sites, that supply fuel. The aim of this rule is to limit the sulfur content in liquid fuels to reduce both the formation of sulfur oxides and particulates during combustion.

3.3.2.3.13 Rule 463

Rule 463 applies to facilities, such as SHP's drill sites, with any above-ground stationary storage tank with a capacity of 75,000 liters or greater used for organic liquids. This rule aims to reduce emissions of VOCs from any above-ground storage tank.

3.3.2.3.14 Rule 464

Rule 464 applies to facilities, including SHP's drill sites, which utilize wastewater equipment that separates petroleum-derived compounds from wastewater. This rule sets specific requirements for the operation, maintenance, and handling of the wastewater separator equipment.

3.3.2.3.15 Rule 1134

Rule 1134 applies to facilities which operate stationary gas turbines of 0.3 megawatt or larger and applies to SHP's Drill Site #2.

3.3.2.3.16 Rule 1148.1

Rule 1148.1 applies to facilities, including SHP's drill sites, such as onshore oil producing wells, well cellars and produced gas handling operation and maintenance activities where petroleum and processed gas are produced, gathered, separate, processed and stored. This rule aims to reduce emissions of VOCs, TACs, and TOCs from the operation and maintenance of the facility to ultimately prevent public disturbance and public health effects.

3.3.2.3.17 Rule 1148.2

Rule 1148.2 applies to any operator, including SHP's drill sites, of an onshore oil and gas, or injection well located in the South Coast AQMD that is conducting drilling, well completion, rework, or acidizing. The purpose of this rule is to gather air quality-related information on oil and gas, and injection wells for drilling, well completion, rework, and acidizing.

3.3.2.3.18 Rule 1166

Rule 1166 applies to facilities, including SHP's drill sites, that have VOC leakage from storage and transfer operations, accidental spillage, or other deposition. This rule sets requirements to control the emission of VOCs from excavating, grading, handling, and treating VOC contaminated soil.

3.3.2.3.19 Rule 1173

Rule 1173 applies to components at facilities, including SHP's drill sites, such as refineries, chemical plants, lubricating oil and grease re-refiners, marine terminals, oil and gas production fields, natural gas processing plants and pipeline transfer stations. This rule aims to control VOC leaks from components such as valves, pumps, and compressors, as well as atmospheric process pressure relief devices.

3.3.2.3.20 Rule 1176

Rule 1176 applies to facilities, including SHP's drill sites, with wastewater systems and associated control equipment located at petroleum refineries, on-shore oil production fields, off-shore oil production platforms, chemical plants, and industrial facilities. This rule aims to limit VOC emissions from wastewater systems.

3.3.2.3.21 Rule 1401

Rule 1401 applies to facilities, including SHP's drill sites, with new, relocated, or modified equipment that emit TACs. This rule establishes allowable health risks for permit units that require new permits. Rule 1401 applies to SHP's permit units based on the maximum potential to emit.

3.3.2.3.22 Rule 1402

Rule 1402 applies to facilities, including SHP’s drill sites, which are subject to the Air Toxics “Hot Spots” Information and Assessment Act (AB 2588), and facilities with emissions that exceed significant or action risk levels. Rule 1402 implements various aspects of AB 2588 and SB 1731 including public notification and risk reduction requirements for facilities with health risks that are above specified thresholds. This rule reduces the health risk associated with emissions of TACs from existing sources by specifying limits for the MICR, cancer burden, and non-cancer acute and chronic HI, and requiring facilities to implement risk reduction plans to achieve these risk limits, as required by the Hot Spots Act and this rule. Rule 1402 requires preparation of an HRA to demonstrate compliance with specified limits. Rule 1402 was amended October 7, 2016 to include a provision to allow facilities to participate in a Voluntary Risk Reduction Program. This program is an alternative to complying with the traditional AB 2588 Program and Rule 1402 approach that provides qualifying facilities an opportunity to reduce health risks below the Notification Risk Level through a Voluntary Risk Reduction Plan and employ a Modified Public Notification approach as specified in Rule 1402. The Voluntary Risk Reduction Program will achieve risk reductions both sooner and beyond what is required in the traditional AB 2588, SB 1731, and Rule 1402 process.

3.3.2.3.23 Regulation XX

Regulation XX – RECLAIM is a market incentive program designed to allow facilities flexibility in achieving emission reduction requirements for NO_x, and SO_x under the Air Quality Management Plan such as add-on controls, equipment modifications, or purchase of excess emission reductions. SHP’s Drill Site #2 is a RECLAIM facility, which means that it is registered in this program to meet the requirements for emission reduction.

3.3.2.3.24 Regulation XXX

Regulation XXX – Title V Permit system is the air pollution control permit system required to implement the federal Operating Permit Program as required by Title V of the federal Clean Air Act. This regulation defines permit application, issuance, and compliance requirements. SHP’s drill sites have no Title V permits.

3.3.2.4 Local

3.3.2.4.1 Oil and Gas Code (Title 16)

The City of Signal Hill has adopted Title 16 of the City’s Municipal Code (Oil and Gas Code), which regulates oil and gas drilling production facilities and related operations (processing, storage transport, etc.) in the City of Signal Hill and sets out the standards for development over and around active and abandoned oil wells within the City limits. The City’s Oil and Gas Code is intended to supplement applicable CalGEM regulations.

3.3.3 Impact Assessment

3.3.3.1 Significance Criteria

Appendix G of the CEQA Guidelines are used to determine whether the Project would result in significant impacts related to air quality. The criteria listed below consider if the Project would:

- a. Conflict with or obstruct implementation of the applicable air quality plan.
- b. 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.
- c. Expose sensitive receptors to substantial pollutant concentrations.
- d. Result in other emissions (such as those leading to odors or adversely affecting a substantial number of people).

3.3.3.1.1 SCAQMD Significance Thresholds

The City of Signal Hill, as the CEQA Lead Agency, also applies the SCAQMD’s thresholds of significance for air quality given it is responsible for managing this resource area for the region. The SCAQMD significance thresholds are designed to implement the general criteria for air quality emissions as required in the CEQA Guidelines, Appendix G, Paragraph III (Title 14 of the California Code of Regulations §15064.7) and CEQA (California Public Resources Code Sections 21000 et. al). SCAQMD’s specific CEQA air quality thresholds for criteria air pollutants, TACs, odor are presented in Tables 3.3-13 through 3.3-15.

Table 3.3-13: SCAQMD Air Quality Thresholds of Significance – Mass Daily Thresholds

Pollutant	Construction	Operation
NO _x	100 pounds per day (lbs/day)	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM ₁₀	150 lbs/day	150 lbs/day
PM _{2.5}	55 lbs/day	55 lbs/day
SO _x	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day

Source: SCAQMD 2023

Table 3.3-14: SCAQMD Air Quality Thresholds of Significance – Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Construction/Operation
NO ₂ 1-hour average annual arithmetic mean	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)
PM ₁₀ 24-hour average annual average	10.4 µg/m ³ (construction) & 2.5 µg/m ³ (operation) 1.0 µg/m ³
PM _{2.5} 24-hour average	10.4 µg/m ³ (construction) & 2.5 µg/m ³ (operation)
SO ₂ 1-hour average 24-hour average	0.25 ppm (state) & 0.075 ppm (federal – 99th percentile) 0.04 ppm (state)
Sulfate 24-hour average	25 µg/m ³ (state)
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)
Lead 30-day average Rolling 3-month average	1.5 µg/m ³ (state) 0.15 µg/m ³ (federal)

Source: SCAQMD 2023

Notes: lbs/day = pounds per day; ppm = parts per million; µg/m³ = microgram per cubic meter; ≥ = greater than or equal to; > = greater than

Table 3.3-15: SCAQMD Air Quality Thresholds of Significance – Toxic Air Contaminants and Odor Thresholds

Pollutant	Construction/Operation
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402

Source: SCAQMD 2023

3.3.3.1.2 Thresholds for Ambient Air Quality Impacts

Appendix G (Environmental Checklist) of the CEQA Guidelines states that a project that would “violate any air quality standard or contribute substantially to an existing or projected air quality violation” would be considered to create significant impacts on air quality. Therefore, an Air Quality Impact Assessment should determine whether the emissions from a project would cause or contribute significantly to violations of the NAAQS or CAAQS (presented above in Tables 3.3-12 through 3.3-14) when added to existing ambient concentrations.

It is SCAQMD’s responsibility to ensure that the NAAQS and CAAQS are achieved and maintained in its geographical jurisdiction, the SCAB. A pollutant’s attainment status in a given sub-region within the SCAB dictates the significance determination for potential increases in ambient air pollution. If the sub-region is in attainment for a specific criteria pollutant, a project’s net contributions plus the measured background concentration of that pollutant cannot exceed the applicable CAAQS (or NAAQS). In sub-regions that are in nonattainment for a specific criteria pollutant, a project’s emissions increase cannot exceed the applicable SCAQMD air quality significance threshold.

The screening-level localized significance thresholds (LSTs) are the quantities of project-related emissions at which localized concentrations (ppm or $\mu\text{g}/\text{m}^3$) could exceed the relevant AAQS for criteria air pollutants for which the SCAB is designated in nonattainment. The screening-level LSTs are based on the proposed project site size and distance to the nearest sensitive receptor. Additionally, the screening-level LSTs are based on the CAAQS, which are the most stringent AAQS, established to provide a margin of safety in the protection of public health and welfare.

3.3.3.1.3 Thresholds for Hazardous Air Pollutants

Rule 1402 applies to facilities that are subject to the Air Toxics “Hot Spots” Information and Assessment Act (AB 2588), and facilities with emissions that exceed significant or action risk levels. This rule reduces the health risk associated with emissions of TACs from existing sources by specifying limits for the MICR, cancer burden, and non-cancer acute and chronic HI, and requiring facilities to implement risk reduction plans to achieve these risk limits, as required by the Hot Spots Act and this rule. Rule 1402 implements various aspects of AB 2588 including requiring preparation of a HRA to demonstrate compliance with specified limits.

In 1992, the California legislature added a risk reduction component called, the Facility Air Contaminant Risk Audit and Reduction Plan (or also known as SB 1731), which required SCAQMD Board of Directors to establish action risk levels and significant risk levels. Table 3.2-14 above presents the thresholds of significance used when evaluating TACs.

3.3.3.1.4 Cumulative Impacts Threshold of Significance

A project impact that is individually limited may nonetheless contribute to a larger cumulative impact. A “cumulative impact” is defined as two or more impacts from related past, current, or probable future projects which, when considered together, are considerable.

A CEQA impact analysis must discuss a cumulative impact if a project impact makes a “cumulatively considerable” contribution to the larger cumulative impact. A project impact is “cumulatively considerable” if the impact is significant when viewed together with similar impacts from related projects. If a project’s incremental contribution to a cumulative impact is not cumulatively considerable, however, the CEQA impact analysis need only briefly describe the basis for its conclusions.

A lead agency may find that a project’s contribution to a cumulative impact is not cumulatively considerable if the project will comply with the requirements of a plan, regulation, or mitigation program and the plan or program: (1) is adopted by an agency with jurisdiction over the affected resources, and (2) sets forth specific requirements that will avoid or substantially lessen the cumulative impact within the relevant geographic area.

The relevant geographic area for analysis of cumulative criteria pollutant air quality impacts herein is the SCAB. The SCAB is a designated air quality control region under the Federal Clean Air Act and a designated air quality basin under the California Clean Air Act. Compliance with both Acts is measured based on criteria pollutant concentrations throughout the SCAB.

In lieu of a list of specific projects, the analysis of cumulative air quality impacts herein uses the summary of projections and conditions set forth in the 2022 Air Quality Management Plan and the Final Program EIR for the 2022 Air Quality Management Plan prepared and certified by the SCAQMD.

The Air Quality Management Plan is an approved plan and mitigation program within the meaning of CEQA Guidelines Section 15064(h)(3). The Air Quality Management Plan was adopted by the SCAQMD through a public process, and the SCAQMD has jurisdiction over air quality throughout the SCAB. The California Legislature has delegated to the SCAQMD the State’s primary responsibility under the Act for achieving and maintaining the NAAQS within the SCAB (HSC Code Sections 40001 and 40412). The Air Quality Management Plan, approved by the USEPA and CARB under the federal and state Clean Air Acts, respectively, sets forth control measures designed to attain the NAAQS and CAAQS (HSC Section 40913). The SCAQMD implements the Air Quality Management Plan control measures through regulations known as “rules” and a permitting scheme (HSC Sections 40440, 40506, and 42300). The SCAQMD has established thresholds for individual projects and if the project emissions are below established thresholds, then the project is viewed as in compliance with the Air Quality Management Plan, and the project’s cumulative impacts are found to be less than cumulatively considerable.

3.3.3.2 Air Quality Analysis Methods and Analysis Results

3.3.3.2.1 Short-Term Construction Emissions

As discussed in Section 2.4, SHP would generally continue drilling/redrilling operations within the existing well cellars at each drill site; however, consistent with past operations, at times a new ancillary well cellar may need to be created. As described above, no more than 20 new well cellars would be constructed over the 20-year Project period. Additionally, no more well cellars would be constructed at any single drill site in excess of the individual totals presented in Table 2.4-8 above.

New well cellars would be created by excavating a shallow hole using a back-hoe type excavator for no more than four hours. While SHP anticipates that most likely only one or two well cellars

would be constructed in a single year, to assess the most conservative scenario, this analysis assumed a maximum of seven well cellars would be constructed in the first year of Project operations across all seven sites for the purpose of criteria pollutant evaluation. Additionally, for the purposes of estimated Project health risks, it was assumed this rate of well cellar construction would continue (at each drill Site), until the final total are fully constructed at each drill site (for example, the full build-out of up to 10 new well cellars at Drill Site #1 is estimated to occur after two operational years; refer to Table 2.4-8).

As discussed in Section 2.4, SHP is also proposing to modify its current natural gas processing system at Drill Site #2 by adding a backup LTS unit and a backup membrane unit. Table 3.3-16 below provides the list of construction equipment and total operating hours to be used for the construction of the new LTS system.

Table 3.3-16: LTS Construction Equipment Activity Summary

Equipment	Total Operating Engine Hours	Average Engine Hours/Day
Backhoe	40	8
Dump Truck	32	4
Water Truck	40	2
Crane	104	8
Welder	144	2
Concrete/Pavement Saw	16	2
Ready-Mix Concrete (RMC) Truck	64	2

Emissions were also quantified for on-road vehicles for the construction of new well cellars and the Drill Site #2 modifications. Total on-road vehicle trips and vehicle types were provided by SHP and are summarized in Table 3.3-17 below, and emissions were estimated using the same activity level assumptions above (i.e., maximum seven new well cellars constructed at the drill sites each year, until up to twenty new cellars have been constructed).

Table 3.3-17: Construction Mobile Emission Sources for Drill Sites

Activity/Operation	Average Trips/Day	Average Travel Distance (miles)
Gas System Modification - Contractor/Gear Trucks	6	3
Gas System Modification - Heavy-Duty Trucks (Equipment/Deliveries)	2	5
Gas System Modification - Ready-Mix Concrete (RMC) Trucks	2	10
Well Cellar Construction - Employee/Contractor	2	3
Well Cellar Construction - Equipment Delivery	1	5

On-site emissions associated with construction of the well cellars at all drill sites and the LTS at Drill Site #2 were calculated based on CalEEMod default horsepower, load factors, and emission factors for the construction equipment listed above from the CalEEMod 2020.4.0 User Guide, Appendix D, Table 3.3 and 3.4. EMFAC2021 emission factors were used to quantify the emissions from mobile sources (i.e., on-road vehicles). Accordingly, total short-term emissions were calculated for the construction of the new LTS system and seven new well cellars (the maximum new well cellars that would be constructed in one year across all drill sites). Table 3.3-18 presents the Project’s short-term emissions in comparison with the construction emission thresholds. Analysis details for estimating construction emissions associated with construction activities are located in Appendix D.

Table 3.3-18: Short-Term Construction Project Emissions

Emission Source	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Well Cellar Construction (lb/day)	0.08	0.78	1.12	0.002	0.04	0.04
LTS Construction (lb/day)	0.16	1.35	1.04	0.004	0.05	0.05
Daily Emissions (lb/day)	0.24	2.13	2.16	0.006	0.09	0.08
SCAQMD Significance Threshold (lb/day)	55	55	550	150	150	55
Threshold Exceeded for a Single Year?	No	No	No	No	No	No

3.3.3.2.2 Long-Term Operations Emissions

As discussed in Section 2.4 above, consistent with existing operations, the proposed Project would allow for the continued operation of the existing facilities in addition to new construction of new well cellars at the drill sites and/or new well drilling at each drill site, both of which would continue to be conducted on an as-needed basis. SHP currently owns two drilling rigs, one with a Tier 4 diesel engine with electric components (i.e., SHP Drill Rig #5) and one fully electric rig (i.e., SHP Drill Rig #6). Emissions from new well drilling and re-drilling was calculated for the diesel drilling rig using CARB’s off-road diesel engine Tier 4 standards, the horsepower of the rig, and total hours per year of usage as provided by SHP. Further, while SHP anticipates that most likely only one or two new wells would be drilled and/or existing wells re-drilled in a given year, however, to assess the maximum emissions scenario, this analysis assumed a maximum of five new wells would be drilled, and six existing wells would be re-drilled annually starting in the first year of Project.

Additionally, because the CUP would not specify which drill sites wells may be drilled, the potential exists that the maximum number of new wells to be drilled or re-drills conducted at each site (refer to Table 2.4-8). Therefore, in order to evaluate the potential impacts under this scenario, an analysis of fugitive emissions and health risk effects was conducted on a site-specific basis for each one of the seven drill sites, as discussed further below. That is, the health

risk effects consider continuing operations, and the effects from the maximum emissions case for additional Project components.

Fugitive emissions from new well heads and cellars were calculated from the standard emissions factors applied in SHP's AER reporting to SCAQMD. VOC emissions from well cellars were calculated using the default AER reported emission rate with a 0.5 adjustment factor. SCAQMD Rule 1148.1 restricts the storage of organic liquids in the well cellars to less than 24 hours. Because of Rule 1148.1, the analysis assumes that the well cellars would be "wet" and have exposed organic liquids only 50 percent of the time, which is a conservative assumption considering the cleanup requirements under Rule 1148.1. Therefore, the 0.5 adjustment was applied to the AER emission factor to quantify emissions resulting from well cellars.

Additionally, as discussed above, for the purposes of estimating Project health risks, it was assumed this rate of well cellar construction would continue (i.e., up to seven well cellars per year across all drill sites), until the final total well cellars are fully constructed at each site (for example, full build-out of up to 10 new well cellars at Drill Site #1 is estimated to occur after two operational years). As was done for drilling and re-drilling, the health risk assessment assumed the number of well cellars to be constructed at each drill site is consistent with the estimates presented in Table 2.4-8, even though taken together this would result in greater cumulative activity across all sites than the total new well cellars allowed under the Project. This approach ensures that the potential health risk effects of the Project are fully evaluated at each drill site to analyze the potential worst-case impacts of what would be allowable under the CUP as described for the Project.

Fugitive emissions from new well cellars were calculated using these assumptions. The health risk analysis also assumes a final total maximum of 69 new well heads (considering the maximum number of new wells that could be drilled at each of the drill sites) for fugitive emissions at all drill sites, even though the maximum of 46 new well heads (i.e., the maximum amount of new wells that could be drilled under the Project) would be allowed under the Project (re-drills would not require new well heads).

Once the gas system modifications are fully operational, ongoing fugitive emissions from the new LTS system were calculated based on the component counts for the existing LTS system provided by SHP and the weighted average emission factor for each component type. Emission factors per component type were pulled from SHP's annual emissions reporting to SCAQMD through the AER portal. Since the emission factors components reported in the AER portal varied depending on the process and the component service type (e.g., gas service, light liquid service, etc.), a weighted average of each emission factor by the number of components in that process was used. For components with different service types, the gas service weighted average emission factor was used as a conservative estimate.

The Project also includes the continuance of SHP's existing consolidated oil and gas operations at the seven drill sites covered under CUP 97-03 for the proposed 20-year CUP 97-03 extension

term. These continued operations include the same emissions sources specific to each individual drill site, as well as mobile sources, which currently services all of the drill sites and are not specific to one site/location as detailed in Section 3.3.1.6 and summarized in Table 3.3-6 and 3.3-7. As discussed in greater detail in Section 3.3.1.6. In summary, the emissions associated with continued operations are inclusive of fugitive emissions from the well components, existing well cellar emissions, emissions from tanks, vessels, turbine, and combustion equipment, stationary sources, and mobile source activities (refer to Table 3.3-8). The calculated “baseline” emissions associated with existing emission sources detailed in Table 3.3-9 are representative of “continued operation of existing facilities” over the duration of the 20-year CUP 97-03 extension.

Accordingly, the emissions from operations of the new gas system modification/LTS system at Drill Site #2, future drilling/redrilling throughout the 20-year Project continuance under CUP-97-03, fugitives from 46 new well heads, fugitives from 20 new well cellars constructed, as well as emissions associated with continued operations of existing facilities are summarized and compared to the applicable operational thresholds in Table 3.3-19. Analysis details, including the assumptions utilized, for estimating emissions associated with operations can be found in Appendix D.

Table 3.3-19: Project Operational Emissions

Emission Source	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
LTS Fugitive Emissions (lb/day)	1.71	0.00	0.00	0.00	0.00	0.00
Redrilling (lb/day)	0.14	1.59	2.75	0.00	0.02	0.02
Drilling (lb/day)	0.12	1.32	2.29	0.00	0.01	0.01
New Well Cellars (fugitives) (lb/day)	1.75	0.00	0.00	0.00	0.00	0.00
New Well Heads (fugitives) (lb/day)	0.09	0.00	0.00	0.00	0.00	0.00
Continued Operations of Existing Facilities (lb/day)	38.35	24.73	15.28	1.03	8.45	0.03
Total Daily Emissions (lb/day)	482.16	7.64	20.32	1.03	8.48	0.06
South Coast AQMD Threshold (lb/day)	55	55	550	150	150	55
Threshold Exceeded?	No	No	No	No	No	No

Note: 0.00 could represent < 0.00.

3.3.3.2.3 CO “Hotspot” Analysis

Ambient CO concentrations normally correspond closely to the spatial and temporal distributions of vehicular traffic. Relatively high concentrations of CO would be expected along heavily traveled roads and near busy intersections. CO concentrations are also influenced by

wind speed and atmospheric mixing. CO concentrations may be more uniformly distributed when inversion conditions are prevalent in the valley. Under certain meteorological conditions, CO concentrations along a congested roadway or intersection may reach unhealthful levels for sensitive receptors (e.g., children, the elderly, hospital patients, etc.). This localized impact can result in elevated levels of CO, or “hotspots” even though concentrations at the closest air quality monitoring station may be below NAAQS and CAAQS.

The localized Project impacts depend on whether ambient CO levels in the Project vicinity would be above or below NAAQS. If ambient levels are below the standards, a project is considered to have significant impacts if a project’s emissions exceed one or more of these standards. If ambient levels already exceed a state standard, a project’s emissions are considered significant if they would increase one-hour CO concentrations by 10 ppm or more or eight-hour CO concentrations by 0.45 ppm or more. Typical criteria by which CO “Hot Spot” modeling should be considered include:

1. A traffic study for the project indicates that the Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity would be reduced to LOS E or F; or
2. A traffic study indicates that the project would substantially worsen an already existing LOS F on one or more streets or at one or more intersections in the project vicinity.

SHP’s existing drill sites are already developed industrial oil and gas operations in an existing built out urban environment. Further, the Project includes a gas line upgrade improvement along with continued operations consistent with baseline conditions and thus there would be no substantial additional sources of CO above those associated with vehicle traffic beyond that described for existing operations. While additional vehicles would have to travel to and from Drill Site #2 to facilitate construction of the proposed gas system modifications, these additional vehicle trips would be minimal (see Table 3.3-16 above) and temporary/short-term in nature (i.e., construction is expected to last no more than 6 months). Once the gas system modifications are complete, existing employees and associated vehicles would be sufficient to operate the new equipment. For these reasons, SHP’s drill sites are not anticipated to permanently change or increase operational traffic to within the immediate vicinity of the drill sites, or within the City of Signal Hill more broadly. Therefore, CO “Hotspot” Modeling was not conducted for this Project and no concentrated excessive CO emissions are expected to be generated once temporary construction activities at Drill Site #2 are completed.

3.3.3.2.4 Ambient Air Quality Analysis

The screening-level LSTs are the amount of project-related emissions at which localized concentrations (ppm or $\mu\text{g}/\text{m}^3$) could exceed the NAAQS for criteria air pollutants for which the SCAB is designated nonattainment. The screening-level LSTs are based on the proposed Project site size and distance to the nearest sensitive receptor. Additionally, the screening-level LSTs are based on the CAAQS, which are the most stringent standards, established to provide a

margin of safety in the protection of public health and welfare. For PM₁₀ LSTs were derived based on requirements in SCAQMD Rule 403 – Fugitive Dust.

Table 3.3-20 shows the maximum daily construction emissions (pounds per day) generated during onsite construction activities associated with the Project (i.e., simultaneous construction of the gas system modification at Drill Site #2, and new well cellars) compared with the SCAQMD’s screening-level construction LSTs. The Project is in SCAQMD Source Receptor Area #4 (South Coast Los Angeles County); therefore, Source Receptor Area #4 allowable emissions are used in comparison with the Project emissions. As shown in Table 3.3-20, maximum daily construction emissions associated with the Project would not exceed the SCAQMD screening-level construction LSTs. The analysis presented in this section is conservative since the SCAQMD LSTs apply to on-site emissions only. Note that the construction area at Drill Sites #1, #3, #4, #5, #6, and #7, which is the area for new well cellar construction, are each less than 1 acre, and the construction area for Drill Site #2, which is the area for new well cellar construction and new gas system modification/LTS unit construction, is also less than 1 acre. The threshold levels in SCAQMD’s screening-level construction LSTs are for 1-acre areas. Thus, the LST thresholds are presented for Project areas of 1 acre in Table 3.3-20.

Table 3.3-20: Project Maximum Daily Onsite Localized Construction Emissions

Emission Source	NO _x (lb/day)	CO (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)
Well Cellar Construction	0.78	1.12	0.04	0.04
LTS Construction	1.35	1.04	0.05	0.05
Maximum Daily Emissions	2.13	2.16	0.09	0.08
Significance Threshold: LST for 1-Acre Site at 25 Feet from Source	57	585	4	3
Threshold Exceeded for a Single Year?	No	No	No	No

Table 3.3-21 shows the maximum daily operational emissions (pounds per day) generated during operational activities associated with the Project (new gas system modification/LTS system operations, redrilling existing wells/drilling new wells, new well head and new well cellar fugitive emissions, and continued operations of existing facilities) compared with the SCAQMD’s screening-level operational LSTs. As shown in Table 3.3-21, the maximum daily operational emissions would not exceed the SCAQMD screening-level LSTs.

Note that the majority of Project emissions are associated with the continued operation of SHP’s existing permitted facilities (i.e., at Drill Site #2). Although the PM₁₀ LST for 1-acre sites at 25 meters (82 feet) from the sources is exceeded by the continued operation of existing facilities at Drill Site #2, the nearest receptor to that site is 1,350 feet away. Accordingly, the more appropriate screening threshold for PM₁₀ of 15 lb/day for sources 200 meters (656 feet) away is more appropriate. As such, for Drill Site #2, the maximum total daily emissions would

not exceed the screening threshold for sources 200 feet away. As detailed in Table 3.3-9, none of the other drill sites have PM₁₀ emissions associated with operations of existing facilities. Therefore, the maximum total daily PM₁₀ emissions associated with the Project at every other site would be 0.02 lb/day, which would not exceed the PM₁₀ LST for 1-acre sites with sources 25 meters (82 feet) away. Therefore, the Project’s estimated NO_x, CO, PM₁₀, and PM_{2.5} are below the SCAQMD’s respective screening-level LSTs and the Project is not expected to contribute to potential violations of NAAQS.

Table 3.3-21: Project Maximum Daily Onsite Localized Operations Emissions

Emission Source	NO _x (lb/day)	CO (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)
LTS Fugitive Emissions	0.00	0.00	0.00	0.00
Redrilling	1.59	2.75	0.02	0.02
Drilling	1.32	2.29	0.01	0.01
New Well Cellars (fugitives)	0.00	0.00	0.00	0.00
New Well Heads (fugitives)	0.00	0.00	0.00	0.00
Maximum Continued Operations of Existing Facilities ¹	24.73	15.28	8.45	0.03
Maximum Daily Emissions	27.64	20.32	8.48	0.06
Significance Threshold: LST for 1-Acre Site at 25 Meters from Source	57	585	1	1
Threshold Exceeded for a Single Year?	No	No	Yes¹	No

Note: 0.00 could represent < 0.00

¹ The maximum daily emissions for operations activities at any given individual drill site are associated with Drill Site #2 as detailed in Table 3.3-9. However, the nearest sensitive receptor to Drill Site #2 is 1,350 feet away. As such, the estimated emissions at the nearest residential receptor at Drill Site #2 would be less than reported in this table.

Note also that the LST for PM₁₀ is based on requirements of SCAQMD Rule 403 – Fugitive Dust. None of the PM₁₀ emissions associated with the continued operations of existing facilities are considered “fugitive dust” but are associated with stationary sources (i.e., turbine, diesel internal combustion engine, and gasoline combustion engine) that are regulated in accordance with the existing SCAQMD permit requirements for stationary sources.

3.3.3.3 Impact Discussion

AIR (a). Would the Project conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant. Air quality impacts from proposed projects within City of Signal Hill are controlled through policies and provisions of the City of Signal Hill General Plan (City of Signal Hill 2022c), SCAQMD’s Final 2016 Air Quality Management Plan (SCAQMD 2016), SCAQMD’s draft 2022 Air Quality Management Plan (SCAQMD 2022c) and Southern California Association

of Government’s (SCAG’s) 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (SCAG 2020). In order to demonstrate that a proposed Project would not cause further air quality degradation in either the SCAQMD’s plan to improve air quality within the air basin, or the federal requirements to meet certain air quality compliance goals, each project should also demonstrate consistency with the SCAQMD’s adopted Air Quality Management Plans for O₃ and PM₁₀. The SCAQMD is required to submit a “Rate of Progress” document to CARB that demonstrates past and planned progress toward reaching attainment for all criteria pollutants. The CCAA requires air pollution control districts with severe or extreme air quality problems to provide for a 5% reduction in non-attainment emissions per year. The Air Quality Management Plan prepared for the SCAB by the SCAQMD complies with this requirement. CARB reviews, approves or amends the document and forwards the plan to the USEPA for final review and approval within the SIP.

Air pollution sources associated with stationary sources are regulated through the permitting authority of the SCAQMD under Regulation II, List and Criteria Identifying Information Required of Applicants Seeking a Permit to Construct from the SCAQMD and related rules (Rule 201 through Rule 223). Owners of any new or modified equipment that emits, reduces, or controls air contaminants, except those specifically exempted by the SCAQMD, are required to apply for an Authority to Construct and Permit to Operate (SCAQMD Rule 201). Through this permitting mechanism which include compliance with applicable rules and regulations, the SCAQMD requires that all stationary sources within the project area are subject to the standards of the SCAQMD to ensure that new developments do not result in net increases in stationary sources of criteria air pollutants.

State CEQA Guidelines and the Federal Clean Air Act (Sections 176 and 316) contain specific references on the need to evaluate consistencies between a proposed project and the applicable Air Quality Attainment Plan (AQAP) for the project site. To accomplish this, CARB has developed a three-step approach to determine project conformity with the applicable AQAP:

1. *Determination that an AQAP is being implemented in the area where the project is being proposed.* The SCAQMD has implemented the current, modified Air Quality Management Plan (which serves as the AQAP for the SCAB) as approved by CARB.
2. *The proposed project must be consistent with the growth assumptions of the applicable AQAP.* The Project land use type is an existing oil and gas operation, and continuation of these existing operations was anticipated in the current growth assumptions. Therefore, growth assumptions in the City of Signal Hill General Plan will not need to be modified with the approval of the proposed Project.
3. *The project must contain in its design all reasonably available and feasible air quality control measures.* The proposed Project incorporates various policy and rule-required project design features that will reduce related emissions.

The California Clean Air Act and Air Quality Management Plan identify transportation control measures as methods to further reduce emissions from mobile sources. Strategies identified to reduce vehicular emissions such as reductions in vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, and traffic congestion, can be implemented as control measures under the California Clean Air Act to reduce vehicular emissions as well.

As the continuance of existing operations represented by the proposed Project, and any future growth that may or may not result, is already included in the City of Signal Hill General Plan and the Air Quality Management Plan, conclusions may be drawn from the following criteria:

1. The SCAQMD Air Quality Management Plan develops an attainment demonstration that ensures that ambient air quality standards for all criteria pollutants are met by the established deadlines in the federal Clean Air Act with consideration to future growth and development. The future growth of oil and gas production and extraction in the SCAB were considered within the Air Quality Management Plan future year baseline emissions. Therefore, projections for achieving air quality goals are based on the assumption of future growth for oil and gas development and extraction including that proposed by the Project. As such, the proposed emissions from the Project do not conflict with air planning within the SCAB.
2. That the primary source of emissions from the Project will be continued operation of the existing facilities, drilling and operation of new wells, and motor vehicles and off-road construction equipment that are licensed through the State of California. The emissions for these main sources are already incorporated into SCAQMD's SCAB Emissions Inventory.

Based on these factors, the Project is consistent with the applicable AQAP.

AB 617 Community Emissions Reduction Plan

As discussed in Section 3.3.2.2, AB 617 establishes a framework for development of Community Emissions Reduction Plans in disadvantaged communities. A Community Emissions Reduction Plan for the Wilmington, Carson, and West Long Beach area that includes Drill Site #1 was prepared by the Community Steering Committee under the direction of the SCAQMD. The Community Emissions Reduction Plan lists actions prioritized by the Steering Committee that would reduce emissions and/or exposures within the Community. Oil drilling and production is identified in the Community Emissions Reduction Plan as a local air quality concern priority.

At the state-level, AB 617 requires six measures listed below and followed by detailed discussion of applicability to the Project and how the Project would comply with each:

1. Annual Reporting;
2. Best Available Retrofit Control Technology;
3. Statewide Clearinghouse of Best Available Retrofit Control Technology;
4. Community Air Monitoring;

5. Community Emissions Reduction Programs; and
6. Increased Penalties.

Annual Reporting Requirements

AB 617 requires CARB and local air districts to establish an annual reporting system for certain classes of stationary sources through the Criteria Pollutants and Toxic Emissions Reporting Regulation (HSC, §39607.1(b)(1)). Stationary sources subject to the annual reporting requirements include: (1) facilities required to report GHG emissions to CARB because they generate more than 25,000 metric tons carbon dioxide equivalent (MTCO₂e) annually; (2) facilities authorized to emit 250 tons or more of any nonattainment pollutant or its precursors; and (3) facilities that receive an elevated prioritization score based on cancer or noncancer health impacts. (Id. at §39607.1(a)(2).)

Since SHP reports GHG emissions for all SHP operations under one Mandatory Reporting of Greenhouse Gas Emissions CARB ID, SHP operations all together meet the Criteria Pollutants and Toxic Emissions Reporting definition of a stationary source (see Section 3.8 for further discussion of Project-related emission and regulations). SHP reports criteria pollutant and toxic emissions to SCAQMD through the AER Portal, and SCAQMD submits the emissions data to CARB. Therefore, the proposed Project would be subject to the Criteria Pollutants and Toxic Emissions Reporting annual reporting requirements, and SHP would report emissions associated with the proposed Project through the AER portal to SCAQMD.

BARCT Requirements

AB 617 requires local air districts within nonattainment areas to develop an expedited Best Available Retrofit Control Technology schedule for all industrial sources subject to the state's cap-and-trade mechanism. (Health and Safety Code, §40920.6(c).) The Project is subject to cap-and-trade; therefore, the Project is subject to AB 617's Best Available Retrofit Control Technology requirements. SCAQMD was tasked with identifying rules that apply to facilities subject to cap-and-trade and determining if the rules meet Best Available Retrofit Control Technology requirements. SCAQMD was then required to develop a BARCT implementation schedule to amend those rules to meet the BARCT requirements. Once the rules have been amended, if SHP is subject to those rules, SHP will comply with the new Best Available Retrofit Control Technology requirements as part of their air permits.

Community Air Monitoring

On September 27, 2018, CARB adopted the Community Air Protection Blueprint, and selected Wilmington, Carson, and West Long Beach for both community air monitoring and community emissions reduction.

AB 617 required the SCAQMD to deploy its community air monitoring system no later than July 1, 2019. (HSC §42705.5(c).) The SCAQMD instituted its AB 617 Air Monitoring Plan for the

Wilmington, Carson, and West Long Beach Community (“CAMP”) in April 2019. As part of the community air monitoring system, the SCAQMD may require certain classes of stationary sources to deploy fence-line or other real time emissions monitoring systems. Stationary sources subject to real-time monitoring include: (1) facilities required to report GHG emissions to CARB because they generate more than 25,000 MTCO₂e annually; (2) facilities authorized to emit 250 tons or more of any nonattainment pollutant or its precursors; and (3) facilities that receive an elevated prioritization score based on cancer or noncancer health impacts. (Id. at §39607.1(a)(2).)

As previously discussed, SHP’s full operations meet the definition of a stationary source under the Criteria Pollutants and Toxic Emissions Reporting. However, only Drill Site #1 falls within the Wilmington, Carson, and West Long Beach community. Drill Site #1 does not meet the definition of a stationary source under the Criteria Pollutants and Toxic Emissions Reporting because it would have less than 25,000 MT CO₂e and 250-tons of criteria pollutant emissions annually considering continued operation of existing facilities and construction and operation of additional Project components (refer to Section 3.8.4 for further discussion on Project-related GHG emissions) and would not have an elevated prioritization score.

Community Emissions Reduction Program

As discussed above, the Project would be consistent with applicable control measures in the Community Emissions Reduction Program.

Based on the above factors, the Project would not conflict with or obstruct implementation of the SCAQMD Air Quality Management Plan or other applicable air quality plans and impacts would be less than significant.

AIR (b). Would the Project 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?

Less than Significant. By its very nature, air pollution has aggregate impacts. SCAQMD’s nonattainment status is a result of past and present development within the SCAB. Furthermore, attainment of CAAQS and NAAQS can be jeopardized by increasing emissions-generating activities in the region. A project’s emissions may not in itself, result in nonattainment of the regional air quality standards, but may be cumulatively considerable when taken in combination with past, present, and future development within the SCAB. When assessing whether there is a new significant cumulative effect, the Lead Agency shall consider whether the incremental effects of the project are cumulatively considerable. “Cumulatively considerable” means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects [CCR §15064(h)(1)].

The CEQA Guidelines §15064(h)(3) specify that a Lead Agency may determine that a project’s incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, including, but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located. The SCAQMD has established thresholds for individual projects and if the project emissions are below established thresholds, then the project is viewed as in compliance with the Air Quality Management Plan, and the project’s cumulative impacts are found to be less than cumulatively considerable.

As discussed in Section 3.3.3.2 and shown in Tables 3.3-17, 3.3-19, 3.3-20, and 3.3-21 above, the Project's estimated emissions are below established SCAQMD thresholds. The continued operation of existing facilities provides a baseline of emission sources in addition to those associated with the emissions associated with Project construction activities and operation of the additional Project components. The emissions associated with continued operations of existing facilities are detailed in Table 3.3-9, the emissions associated with construction activities are presented in Table 3.3-18, and the emissions associated with long-term operation of additional Project components are presented in Table 3.3-19. The aggregate emissions associated with the continued operations of existing facilities in addition to construction activities and the aggregate emissions of continued operation of existing facilities and operation of additional Project components (i.e., drilling and re-drilling activities, operation of 46 new wells, operation of 20 new well cellars, and operation of LTS) are summarized in Table 3.3-22. The combined emissions for construction and operations are below applicable SCAQMD’s daily emissions thresholds. For these reasons, the Project’s potential impacts would not be cumulatively considerable, and the potential cumulative impact would be less than significant.

Although potential impacts were found to be less than significant, to further ensure Project emissions would be reduced to the extent feasible, SHP has committed to implementing Voluntary Measure VM AQ-1 to reduce emissions beyond the requirements of SCAQMD Rule 403.

Table 3.3-22: Total Project Construction and Operation Emission for all CUP Sites

Emissions Source	ROG (lb/day)	NO _x (lb/day)	CO (lb/day)	SO _x (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)
Project Construction + Continued Operation of Existing Facilities Emissions	38.59	26.86	17.44	1.036	8.54	0.11
Project Operation + Continued Operation of Existing Facilities Emissions	42.16	27.64	20.32	1.03	8.48	0.06
SCAQMD Significance Threshold	55	55	550	150	150	55
Threshold Exceeded for a Single Year?	No	No	No	No	No	No

Refer to Appendix D for detailed analysis of existing and Project-related emissions.

SHP Voluntary Measures

VM AQ-1: The following measures would be implemented during construction activities to further reduce air quality impacts in an O₃ nonattainment area beyond the requirements of Rule 403. These measures would be adhered to during construction of the gas system modification at Drill Site #2, as well as construction of new well cellars at the other drill sites:

- Limit and remove the accumulation of mud and/or dirt from adjacent public roadways at the end of each workday (Use of dry rotary brushes is prohibited except when preceded or accompanied by sufficient wetting to limit visible dust emissions and use of blowers is expressly forbidden).
- Cover and contain all soils removed during transport.
- Stabilize the surface of storage piles following the addition or removal of materials using water or chemical stabilizer/suppressants.
- Remove visible track-out from the site at the end of each workday.
- Cease grading or other activities that cause excessive (greater than 20% opacity) dust formation during periods of high winds (greater than 20 mph over a one-hour period).
- Maintain all construction equipment as recommended by manufacturer manuals.
- Shut down construction equipment when not in use for extended periods.
- Construction equipment shall operate no longer than eight (8) cumulative hours per day (with the exception of well drilling operations).
- Use electric equipment for construction whenever possible in lieu of diesel or gasoline powered equipment, unless notice is provided in writing to the City with rationale provided for alternative equipment and approved by the City.
- Stop use of high-emitting construction equipment during periods of high or excessive ambient pollutant concentrations.
- All construction vehicles shall be equipped with proper emissions control equipment and kept in good and proper running order to substantially reduce NOx emissions.
- On-Road and Off-Road diesel equipment shall use diesel particulate filters if permitted under manufacturer’s guidelines.
- On-Road and Off-Road diesel equipment shall use cooled exhaust gas recirculation (EGR) if permitted under manufacturer’s guidelines.
- All construction workers shall be encouraged to shuttle (car-pool) to retail establishments or to remain on-site during lunch breaks.
- All construction activities within the project area shall be discontinued during the first stage smog alerts.

- Construction and grading activities shall not be allowed during first stage O₃ alerts. First stage O₃ alerts are declared when the O₃ level exceeds 0.20 ppm (1-hour average).

AIR (c). Would the Project expose sensitive receptors to substantial pollutant concentrations?

Less than Significant. As detailed in Section 3.3.3.1.1, the SCAQMD has set the level of significance for carcinogenic risk at ten in one million, which is understood as the possibility of causing ten additional cancer cases in a population of one million people. For non-cancer risk (both chronic and acute), the level of significance is a hazard index of 1.0. Note that the SCAQMD risk thresholds are identical to those adopted in AB 2588.

Consistent with the California OEHHA *Risk Assessment Guidelines* (2015), all residential and sensitive receptors were modeled with a 30-year exposure duration for future Project operation, as well as the aggregate health effects of continued operation of existing facilities (i.e., existing/baseline) activities plus additional future Project activities, and all business receptors were modeled with a 25-year exposure for continued operation of existing facilities and construction and operation of additional Project components. As discussed in Section 3.3.3.2.2 above, for the purposes of the health risk analysis, additional Project operations are inclusive of the most conservative operations profile with each drill site as described in Table 2.4-8, which indicates that maximum number of new wells that would be drilled on each of the drill sites over the 20 year period, along with the maximum number of wells that would be redrilled at each CUP site, even though when taken together this results in higher cumulative emission when compared to the emission associated with maximum activity across all drill sites of no more than 46 new wells drilled and operating, 28 existing wells redrilled, and all 20 new well cellars installed and in use throughout the entire 20-year duration of the permitted operations. While this assumes more drilling, redrilling and well cellar construction than is requested for the CUP Extension Project, the health risk at each drill site was calculated to ensure that maximum impacts are determined. Using these assumptions, the Project's health risk results were below the SCAQMD thresholds for potential cancer risk impacts, and non-cancer potential chronic and acute impacts. Sensitive receptors as identified in Figure 3.3-2.

As shown, none of the emissions at any of the drill sites would result in health risks above established thresholds for any receptors located outside the drill site fence line. As analyzed in discussed in further detail in Appendix C, the carcinogenic risk and the health hazard index (HI) for chronic non-cancer and acute risk at the maximum exposed individual resident (MEIR) and maximum exposed individual work (MEIW) do not exceed the significance levels of ten in one million (10×10^{-6}) and 1.0, respectively for the Project. The MEIRs and MEIWs for the Project are identified by receptor location and risk and a Table 3.3-23 presents the cancer health risks for continued operation of existing facilities, construction, and operations of additional Project components as well as the total combined risk of continued operations plus additional Project components. Table 3.3-24 presents the Project non-cancer chronic health risks, and Table 3.3-25 presents the Project non-cancer acute health risks.

Table 3.3-23: Project Cumulative Cancer Health Risk Impacts Predicted by HARP2

Category	Maximum Exposed Individual Resident	Maximum Exposed Individual Worker
Continued Operation of Existing Facilities	4.42 in a million	0.74 in a million
Construction	0.2693 in a million	0.005 in a million
Operation of Additional Project Components	1.4452 in a million	0.036 in a million
Total¹	6.1345 in a million	0.781 in a million
Threshold	10 in a million	10 in a million
Exceeds Threshold?	No	No

Refer to Appendix D for detailed analysis of existing health risk impacts.

Notes:

¹ The maximum exposed individual resident and worker for continued operation of existing facilities and construction and operation of additional Project components scenarios may not be at the same location. Although the maximum exposed individuals are different for the continued operation of existing facilities and additional Project components, by comparing the combined total of the maximum results to the applicable threshold, this represents a conservative overestimate of individual health risk exposure.

Table 3.3-24: Existing and Future Project Cumulative Non-Cancer Chronic Impacts Predicted by HARP2

Category	Maximum Exposed Individual Resident	Maximum Exposed Individual Worker
Continued Operation of Existing Facilities	0.02	0.02
Construction	0.00032	0.002
Operation of Additional Project Components	0.00183	0.001
Total¹	0.022	0.023
Threshold	1.0	1.0
Exceeds Threshold?	No	No

Refer to Appendix D for detailed analysis of existing health risk impacts.

Notes:

¹ The maximum exposed individual resident and worker for continued operation of existing facilities and construction and operation of additional Project components scenarios may not be at the same location. Although the maximum exposed individuals are different for the continued operation of existing facilities and additional Project components, by comparing the combined total of the maximum results to the applicable threshold, this represents a conservative overestimate of individual health risk exposure.

Table 3.3-25: Existing and Future Project Cumulative Non-Cancer Acute Impacts Predicted by HARP2

Category	Maximum Exposed Individual Resident	Maximum Exposed Individual Worker
Continued Operation of Existing Facilities	0.01	0.01
Construction	0.000	0.000
Operation of Additional Project Components	0.001	0.002
Total¹	0.011	0.012
Threshold	10 in a million	10 in a million
Exceeds Threshold?	No	No

Refer to Appendix D for detailed analysis of existing health risk impacts.

Notes:

¹ The maximum exposed individual resident and worker for continued operation of existing facilities and construction and operation of additional Project components scenarios may not be at the same location. Although the maximum exposed individuals are different for the continued operation of existing facilities and additional Project components, by comparing the combined total of the maximum results to the applicable threshold, this represents a conservative overestimate of individual health risk exposure.

As shown in Table 3.3-23, Table 3.3-24 and Table 3.3-25, when applying the analysis approach summarized above, the maximum predicted residential cancer risk for the combined existing emissions and future Project emissions is 6.1345 in a million for residents and 0.781 in a million for workers and is below the applicable SCAQMD cancer risk threshold of greater than 10 in a million. Note that in this analysis, the maximum exposed individual resident and worker for continued operation of existing facilities and construction and operation of additional Project components scenarios may not be at the same location. Although the maximum exposed individuals are different for the continued operation of existing facilities and construction and operation of additional Project components, by comparing the combined total of the maximum results to the applicable threshold, this represents a conservative estimate of individual health risk exposure.

Similarly, the maximum chronic non-cancer hazard index for the combined Project is 0.022 for resident exposure and 0.0234 for worker exposure, and both are well below the applicable HI threshold of 1.0. Lastly, the maximum acute non-cancer hazard index for the combined Project is 0.011 for resident exposure and 0.01 for worker exposure, and both are well below the applicable HI threshold of 1.0. When applying the stated analysis approach, the Project results (i.e., the combined continued operation of existing facilities, the proposed Project construction, and the proposed operations of the additional Project components MEIRs and MEIWs) remained below the significance threshold for cancer and chronic and acute non-cancer risk; for these reasons the proposed Project would not have an adverse health effect to any of the surrounding communities.

In summary, the potential health risk attributable to the proposed Project (i.e., continued operations of existing facilities and construction and operation of additional Project components) is determined to be less than significant based on the following conclusions:

1. Potential carcinogenic risk from the proposed Project is below the significance level of ten in a million at each of the modeled receptors; and
2. The hazard index for the potential chronic non-cancer risk from the proposed Project is below the significance level of 1.0 at each of the modeled receptors in all areas within and outside of the drill site boundaries.
3. The hazard index for the potential acute non-cancer risk from the proposed Project is below the significance level of 1.0 at each of the modeled receptors in all areas within and outside of the drill site boundaries.

Therefore, potential risks to the population attributable to emissions of TACs from the proposed Project would be less than significant.

AIR (d). Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less than Significant. The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. Substantial odor-generating operations include wastewater treatment facilities, composting facilities, agricultural operations, and heavy industrial operations. Potential sources of operational odors generated by the Project would include new wells and the new gas system modification/LTS unit system, both of which would have vapor recovery that is routed to the turbine at Drill Site #2 and are subject to SCAQMD Rule 1148.1 and 1173 requirements. As part of compliance with Rule 1148.1, SHP is required to maintain an Odor Mitigation Plan that includes monitoring and mitigation requirements. For these reasons, these potential new odor sources would be required to comply with the plan and as such would generate minimal additional odor. In addition, SCAQMD Rule 402 acts to prevent occurrences of odor nuisances per the following requirement, "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property." Therefore, potential operational-source odor impacts would be less than significant.

Residual Impacts

Although no significant impacts to air quality were identified as part of the proposed Project, SHP has proposed one voluntary measure to further reduce impacts to ensure community compatibility over the duration of the long-term extension and reduce emissions associated with operations. Specifically, incorporation of **VM AQ-1** would reduce the amount of particulate

matter entrained in the ambient air due to fugitive dust and would further reduce air quality impacts in an O₃ nonattainment area beyond the requirements of Rule 403.

3.4 Biological Resources

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	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 Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.4.1 Environmental Setting

The Environmental Resources Element of the City of Signal Hill General Plan describes the biological resources present in Signal Hill. Historically, the dominant plant community in the City was coastal sage scrub. However, following development of the area, this native community has been replaced by ruderal species due to brush clearing activities. Remnants of sage scrub communities may be found in some of the brushy, open areas adjacent to existing oil wells within the city limits (City 1986). Available habitat in Signal Hill is degraded and as such, most animals are expected to be common, widespread, and highly adaptable species. No plant or wildlife species designated as rare, threatened, or endangered by the U.S. Fish and Wildlife Service (USFWS), the California Department of Fish and Wildlife (CDFW), or California Native Plant Society (CNPS) have been located or are expected to occur within the City of Signal Hill (City 1986).

3.4.1.1 Vegetation Communities and Land Cover Types

The drill sites are all previously disturbed and developed sites with limited vegetation present. Ornamental vegetation is primarily located outside of the drill site fence line and some vegetation is present within the sites. A biological reconnaissance survey was conducted at the drill sites on June 8, 2022, to characterize the existing vegetation communities and potential wildlife habitats (Appendix E). The disturbed/developed land cover areas at the drill sites support ornamental trees and patches of scattered non-native vegetation such as flax-leaved

horseweed (*Erigeron bonariensis*), pigweed (*Amaranthus albus*), Bermuda grass (*Cynodon dactylon*), puncture vine (*Tribulus terrestris*), and other non-native grasses (*Bromus* sp.), which are present at a low cover. The tree dominated vegetation communities identified during the survey include eucalyptus groves and ornamental trees (ECORP 2022a). Results of the survey for each drill site are included in Table 3.4-1.

Table 3.4-1: Existing Vegetation Communities and Land Cover Types Observed at Drill Sites

Drill Site	Vegetation Communities and Land Cover Types
#1	Consists of mostly disturbed/developed areas with injectors primarily located in the middle portion of the site. Climbing fig (<i>Ficus pumila</i>), an evergreen climbing vine, was observed growing on the walls surrounding the site. Chinese elm trees (<i>Ulmus parvifolia</i>) were observed within the site and palm trees (<i>Washingtonia</i> sp.) are located outside bordering the site.
#2	Consists primarily of disturbed/developed areas with injectors, above ground pipes, storage tanks, and other structures were observed at the time of the survey. Ornamental trees occur in some portions of the site including Brazilian peppertree (<i>Schinus terebinthifolius</i>), Chinese elm, and ash trees (<i>Fraxinus</i> sp.). One native mulefat (<i>Baccharis salicifolia</i>) shrub was observed on the western slope of the site. Eucalyptus trees (<i>Eucalyptus</i> spp.) were observed outside the site boundary along the northern portion of the site and the canopies of the trees overhang the site boundary.
#3	Consists of disturbed/developed areas with injectors and other structures observed within the site. Ornamental trees including eucalyptus trees, bottlebrush (<i>Melaleuca viminalis</i>), and wattle trees (<i>Acacia</i> sp.) are located primarily outside the CUP site; however, the tree canopies overhang the site boundary.
#4	Consists of disturbed/developed areas with injectors, above ground pipes and other structures present primarily along the western portion of the site. Ash and eucalyptus tree canopies overhang the site boundary primarily on the western and southern portions.
#5	Eucalyptus groves are present within and adjacent to the site to the south and southwest. The vegetation community is dominated by eucalyptus trees with an open and continuous sparse to intermittent shrub layer. Low density of other ornamental trees and shrubs including Chinese elm and Peruvian peppertree (<i>Schinus molle</i>) are also present within this community along the western edge of the site. Ornamental trees and shrubs located in the middle and north/northeast portions of the site include a mix of Mexican fan palm tree, eucalyptus trees, pine trees (<i>Pinus</i> sp.), jade (<i>Crassula ovata</i>), and common non-native ice plant (<i>Carpobrotus</i> sp.). The rest of the site is considered disturbed/developed with existing structures, above ground pipes, and storage tanks.
#6	Consists of mainly disturbed/developed areas with existing structures and a storage tank. Ornamental trees are present within the western portion of the site. Eucalyptus and pepper trees were observed outside the site and their canopies overhang the site boundary.
#7	Consists of disturbed/developed areas with some structures and an active oil producer located on the eastern portion of the site. No vegetation was observed at this site.

Source: ECORP 2022a

3.4.1.2 Common Wildlife

The drill sites provide suitable foraging, nesting, and cover habitats that could be used by locally common wildlife species. During the biological survey the following wildlife species were observed/detected: common raven (*Corvus corax*), house sparrow (*Passer domesticus*),

mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), black phoebe (*Sayornis nigricans*), barn swallow (*Hirundo rustica*), Allen’s hummingbird (*Selasphorus sasin*), western fence lizard (*Sceloporus occidentalis*), and side-blotched lizard (*Uta stansburiana elegans*). No raptor species were observed, but red-tailed hawk (*Buteo jamaicensis*) is a species that is typically seen in similar habitat within ornamental and eucalyptus trees. Any of the common mammal species found in the suburban areas of southern California may use or traverse various drill sites on occasion including raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), and small rodents (ECORP 2022a).

The ornamental trees, eucalyptus groves, shrubs, utility poles, and structures/buildings on the drill sites provide potential nesting habitat for migratory birds and raptors. Habitat for ground-nesting bird species is present on each of the drill sites. The trees and other vegetation located adjacent to the drill sites could also provide nesting habitat for bird species. During the biological survey, nesting activity was observed in the ornamental trees located on Drill Sites #6 and #7. No roosting bats were observed at any of the drill sites, but potential suitable roosting habitat for bats is present in the existing structures/buildings and ornamental trees located on the drill sites (ECORP 2022a).

3.4.1.3 Special Status Species

Special status species are plants and animals that meet the definition of rare, threatened, or endangered pursuant to §15380 of the CEQA Guidelines. Special status species discussed in this document include the following:

- Species listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (ESA).
- Species listed or proposed for listing as threatened or endangered under the California Endangered Species Act (CESA).
- Species that are recognized as candidates for future listings by agencies such as USFWS, National Oceanic and Atmospheric Administration’s National Marine Fisheries Service, and CDFW.
- Species defined by CDFW as Species of Special Concern.
- Species classified as Fully Protected by CDFW.
- Bat species listed by the Western Bat Working Group as priority species.
- Plant species, subspecies, and varieties defined as rare or threatened by the California Native Plant Protection Act (California Fish and Game Code § 1900 et seq.).
- Plant species listed by the CNPS as List 1 and 2 and some List 3 plants under CEQA (CEQA Guidelines §15380).

A literature review using the CDFW's California Natural Diversity Database (CNDDDB) and the CNPS online inventory was conducted to identify a list of potential special status species that could occur in the Project area (ECORP 2022a). The CNDDDB is an inventory of the status and locations of rare plants and animals in California managed by CDFW. A list of special status species with potential to occur on or adjacent to the Project site was generated from the results of the literature review and the drill sites were evaluated for suitable habitat that could support listed plant or wildlife species.

Most of the special status wildlife and plant species identified by CNDDDB and CNPS that occur in the region surrounding the drill sites have very specific habitat needs that are not present within the Project area. Therefore, these species were eliminated from further consideration. Following the site visit to evaluate existing conditions on each of the drill sites, a determination was made that all the plant species reported in the literature review have a low potential or are presumed absent from the drill sites due to a lack of suitable habitat and/or a lack of recent documented occurrences (ECORP 2022a).

Based on the background literature review, three special status wildlife species were identified as having a moderate or low to moderate potential to occur within the Project area: overwintering monarch butterfly (*Danaus plexippus*), silver-haired bat (*Lasionycteris noctivagans*), and big free tailed bat (*Nyctinomops macrotis*).

Big Free Tailed Bat

This species is a CDFW Species of Special Concern (SSC) and is a seasonal migrant. Big free tailed bats roost mainly in the crevices of cliff rocks though there is documentation of roosting in buildings, caves, and tree cavities. This species typically lives in deserts and arid grasslands where rocky outcrops, canyons, or cliffs provide ideal roosts. The big free tailed bat was documented in Long Beach in 1983 approximately 1.5 to 2.5 miles southwest of the drill sites. Based on the recorded occurrence of this species 1.5 miles from the drill sites and the presence of potential suitable roosting habitat in the ornamental trees within the drill sites and existing structures/buildings located in Drill Sites #5, #6, and #7, this species has a low to moderate potential to occur (ECORP 2022a).

Silver-haired Bat

Silver-haired bats are listed as a medium priority species by the Western Bat Working Group. This species often roosts in tree cavities or in bark crevices on tree trunks, especially during migration. However, some individuals overwinter in buildings, which may allow them to spend the winter in places that would otherwise be too cold. This species was documented in 1986 approximately 1.6 miles southwest of Drill Site # 1 (approximately 2.7 miles west of Drill Sites #6 and #7) in Long Beach just south of the intersection of 20th Street and Maine Avenue; and 5 miles northeast of the drill sites between I-605 and SR-91. Based on the presence of potential suitable roosting habitat in the ornamental trees within or surrounding the drill sites, as well as

the existing structures/buildings located in Drill Sites #5, #6 and #7, this species was determined to have a low to moderate potential to occur.

Monarch Butterfly Overwintering Population

This species is a federal candidate for listing as endangered under the ESA. Overwintering monarch butterflies require dense stands of non-native trees, particularly eucalyptus planted in the mild coastal zone which provide appropriate microclimate. Overwintering sites must provide shelter from wind and a varied light environment ranging from full sun to deep shade. Overwintering populations of monarch butterflies have been documented approximately 1 mile southeast, 2.4 miles northeast, 3.7 miles east, and 4.4 miles west of the drill sites. The eucalyptus groves located on Drill Site #5 provide potentially suitable roosting habitat. However, overwintering populations have not been documented onsite and they were not observed during the biological survey. Based on the recorded observations of monarch butterflies in the region surrounding the drill sites and the presence of suitable eucalyptus groves, the monarch butterfly has a moderate potential to occur on Drill Site #5 (ECORP 2022a).

3.4.1.4 Critical Habitat

Critical habitat is a term that is defined and used in the federal ESA. Critical habitat includes specific geographic areas that contain features essential to the conservation of an endangered or threatened species and that may require special management or protection. Critical habitat may also include areas that are not currently occupied by an endangered or threatened species, but that will be needed for its recovery. None of the drill sites are located within critical habitat for threatened and endangered species.

3.4.1.5 Wetlands

The USFWS National Wetland Inventory Wetlands Mapper identifies existing wetlands and riparian areas. A desktop review using this mapper showed no wetlands present at or in the vicinity of the drill sites. A formal aquatic resources delineation was not completed as part of the biological site visit. However, no jurisdictional waters of the U.S. or waters of the State were identified on the drill sites (ECORP 2022a).

3.4.1.6 Wildlife Corridors

A wildlife corridor allows movement between historically connected habitats/natural areas and facilitates movement between these habitat areas without other disturbances, like traffic or development. They allow exchange of individuals between populations and connect various habitats required for species to complete their life history, like feeding and breeding grounds.

The Project area was assessed for the ability to facilitate wildlife movement and for the presence of wildlife corridors during the biological resources survey. The drill sites do not function as wildlife movement corridors because the sites are disturbed/developed, support

minimal vegetation cover, and are surrounded by roads and urban development. The drill sites do not support native habitat that would support wildlife movement and the fencing and gates on the sites and the surrounding structures are not conducive to wildlife movement. The drill sites area not located along any major drainages or washes that would be considered movement corridors for wildlife. Wildlife may use the limited vegetation on the drill sites during local movement, but the sites are not part of a regional wildlife movement corridor or a corridor between natural habitat areas (ECORP 2022a).

3.4.2 Regulatory Setting

3.4.2.1 Clean Water Act

The Clean Water Act has provisions for protecting biological resources within the aquatic environment through identification of beneficial uses and prohibitions on fill of wetlands or other waters of the United States. The primary function of the Clean Water Act is in protecting biological resources in this instance are to ensure that any impacts to wetlands or other waters of the United States are compensated for and provide a framework for ensuring that water quality is maintained or improved. No wetlands or other waters of the United States are present on or in the vicinity of the drill sites.

3.4.2.2 Endangered Species Act

The federal ESA protects threatened and endangered species by prohibiting federal actions that would jeopardize the continued existence of such species or result in destruction or adverse modification of any critical habitat of such species. If effects to listed species are anticipated, Section 7 of the ESA requires consultation regarding protection of such species be conducted with the USFWS and/or the National Marine Fisheries Service prior to project implementation. (16 USC 1531, 1536).

3.4.2.3 Migratory Bird Treaty Act

Congress passed the Migratory Bird Treaty Act (MBTA) in 1918 to prohibit the kill or transport of native migratory birds, or any part, nest, or egg of any such bird unless allowed by another regulation adopted in accordance with the MBTA. The prohibition applies to birds included in the respective international conventions between the United States and Great Britain, the United States and Mexico, the United States and Japan, and the United States and Russia.

Migratory bird species receive federal protection under the MBTA and state protection under CEQA Guidelines Section 15380(d). In the case of bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*), additional protection is offered under the federal Bald and Golden Eagle Protection Act. All birds, except European starlings, English house sparrows, rock doves (pigeons), and non-migratory game birds such as quail, pheasant, and grouse, are

protected under the MBTA. No permit is issued under the MBTA; however, a project would need to employ measures that would avoid or minimize impacts to protected migratory birds.

3.4.2.4 California Endangered Species Act

The CESA focuses on protecting all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation.

3.4.3 Impact Assessment

The Initial Study for the Project determined that no impacts would occur with regard to riparian habitats, sensitive natural communities, or wetlands and that the Project would not conflict with any adopted ordinances or plans related to biological resources. Therefore, these issues are not addressed further in this EIR.

BIO (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 CDFW or USFWS?

Less than Significant with Mitigation. Although evidence of the presence of bats was not observed on any of the drill sites during a biological survey, the existing structures/buildings (Drill Sites #5, #6, and #7) and ornamental trees at the drill sites could provide potential habitat for two species of special-status bats (silver-haired bat and big free-tailed bat) and other common species of bats. Ongoing operations could have a *potentially significant* impact on a special status bat species if present in an existing structure or trees that is proposed to be removed or trimmed as part of ongoing operations. Similarly, new Project activities could have a *potentially significant* impact on a special status bat species if present in an existing structure or trees to be removed or trimmed prior to construction.

Overwintering populations of monarch butterflies have not been documented onsite and they were not observed during the biological survey. No impacts to potentially suitable habitat for monarch butterflies are anticipated as a result of the Project.

Vegetation present on the drill sites, as well as the existing utility poles and buildings/structures may support the nesting activities of raptors and other migratory and resident bird species. Nesting bird activity was observed on the drill sites during the biological survey. Similarly, ground-nesting bird species also have the potential to occur. If new construction, vegetation maintenance, or tree removal activities are conducted during the nesting season (February 1 through August 31), there is a potential that nesting birds could be impacted by Project activities. Ground-disturbing construction activities, specifically construction of new well cellars or construction of the new LTS at Drill Site #2, could directly affect birds and their nests through the removal of habitat on the Project site and indirectly through increased noise, vibrations,

and human activity. Ongoing operations could have a *potentially significant* impact on nesting birds if vegetation management activities occur during the nesting season. New Project activities could have a *potentially significant* impact on nesting birds if construction or vegetation management activities occur during the nesting season.

Mitigation Measure BIO-1: Pre-construction Bat Surveys.

To ensure potential impacts to roosting bats are avoided, no existing structures/buildings or trees located on the existing drill sites shall be removed or demolished as a result of the Project. If structures/buildings or trees are removed from within the drill sites, a pre-construction bat survey shall be conducted by a qualified bat biologist to evaluate structures proposed for demolition, or tree removal that could potentially provide bat roosting habitat as result of the Project. If suitable roosting habitat and/or signs of bat use is identified during the assessment, focused surveys shall be conducted and appropriate avoidance and minimization measures implemented. Such measures may include any of the following as necessary and appropriate to the findings of the focused surveys: spatial and temporal avoidance measures, no-disturbance buffers, passive exclusion of bats outside of the maternity season (if necessary).

Mitigation Measure BIO-2: Pre-construction Nesting Bird Surveys. New construction activities associated with the proposed Project include installation of the new gas system components at Drill Site #2, as well as construction of new well cellars at the drill sites. Therefore, construction of the gas system improvements and new well cellar construction shall be conducted during the non-breeding season for birds (approximately September 1 through January 31) to avoid violations of the MBTA and California Fish and Game Code §§ 3503, 3503.5 and 3513. If activities with the potential to disrupt nesting birds are scheduled to occur during the bird breeding season (February 1 through August 31), a pre-construction nesting bird survey shall be conducted by a qualified biologist who is experienced in the identification of avian species and conducting nesting bird surveys no more than three days prior to the start of the construction, vegetation management, or tree removal activities. The nesting bird survey shall include the areas where the activities will occur and adjacent areas where the activities have the potential to cause indirect impacts to nesting birds. If nesting birds are not observed during the survey, construction activities, vegetation management, or tree removal may begin. If nesting birds (including nesting raptors) are observed during the survey, avoidance or minimization measures shall be implemented by the Project biologist to avoid potential Project-related impacts to active nests. Measures may include but not be limited to biological monitoring during the activities, seasonal work restrictions, or establishment of a no-work buffer around active nests until nesting has been completed as determined through periodic nest monitoring conducted by the biologist. The size of the no-work buffer shall be determined by the Project biologist (depending on the species) until the juveniles have fledged and there has been no evidence of a second attempt at nesting, as determined by the Project biologist.

Residual Impacts

Incorporation of **MM BIO-1** and **MM BIO-2** would ensure that appropriate surveys are conducted for special status species and measures are in place to reduce potential impacts on special status species, if present, to a less than significant level. MM BIO-1 would be implemented prior to removal of existing structures or trees on the drill sites that have potential for bats, to avoid take or other adverse impacts to special status bats or to maternity colonies of native bat species. To avoid impacting nesting birds during new construction or vegetation management activities, MM BIO-2 would be implemented during the nesting season.

BIO (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?

Less than Significant with Mitigation. The drill sites do not currently function as wildlife movement corridors. The drill sites are disturbed/developed and do not support native habitat that would support wildlife movement. In addition, the existing fencing and gates on the sites and the surrounding roads and urban development are not conducive to wildlife movement. Wildlife may use the limited vegetation on the drill sites during local movement, but the sites are not part of a regional wildlife movement corridor or a corridor between natural habitat areas. Continued operations would not result in impacts on wildlife movement. New Project activities, including drilling and operation of new wells, and modifications to the gas plant at Drill Site #2 would not result in impacts on wildlife movement.

Impacts to maternity roosting sites of any native bat species, regardless of status, may be considered a significant impact to a native wildlife nursery site. Evidence of the presence of roosting bats was not observed on any of the drill sites during the biological reconnaissance survey. However, potential suitable roosting habitat for bats is present in the existing structures/buildings (Drill Sites #5, #6 and #7) and ornamental trees on the drill sites. Because suitable habitat is present, ongoing operations could have a potentially significant impact on a maternity roost site if present in trees to be removed or trimmed.

Because suitable habitat is present at the drill sites, new Project activities could have a potentially significant impact on a maternity roost site if present in an existing structure or trees to be removed or trimmed as part of construction.

Residual Impacts

Incorporation of **MM BIO-1** would ensure that measures are in place to reduce potential impacts on a native wildlife nursery site to a less than significant level. Prior to removal of existing structures or trees on the drill sites that have potential for bats, surveys would be conducted to determine if bats are present and to ensure impacts to any bat maternity roosts do not occur.

3.5 Cultural Resources

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	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 pursuant to § 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.5.1 Environmental Setting

Cultural resources include the locations of human activity, occupation, or usage that contain materials, structures, or landscapes that were used, built, or modified by people. Cultural resources consist of a variety of prehistoric and historic archaeological resources including sites, objects, buildings, structures, districts, and properties of religious and cultural significance including traditional cultural properties. Historic properties, as defined in 36 CFR 800, the implementing regulations of the National Historic Preservation Act (NHPA), are cultural resources that meet the criteria to be included in or eligible for inclusion in the National Register of Historic Places (NRHP).

The Environmental Resources Element of the Signal Hill General Plan describes historical resources located in Signal Hill, which include oil development and historical structures. Oil was discovered in 1921 and provided the City with the financial resources to develop. The discovery led to speculative oil development of the area and resulted in one of the largest historical oil fields in the state. The first well, Alamitos #1 Discovery Well (Historic Landmark # 580), located at the northeast corner of Hill Street and Temple Avenue, is designated as a state historical monument (City 1986). Alamitos #1 Discovery Well is located approximately 0.14 miles south of CUP Site #5 and 0.43 miles northwest of CUP Site #6. No designated Los Angeles County historical landmarks are located within any drill site (ECORP 2022b).

A records search of the California Historical Resources Information System (CHRIS) was conducted on July 25, 2022, with the South Central Coastal Information Center at the California State University-Fullerton. The purpose of the records search was to determine the extent of previous surveys within the boundaries of the drill sites, and whether previously documented pre-contact or historic archaeological sites, architectural resources, or traditional cultural

properties exist within the Project area. In addition to the records search, a review of historic maps and aerial photographs was also conducted.

The drill sites are all located on previously disturbed and developed parcels. The CHRIS records search results indicated that approximately 45 percent of the drill sites have been previously surveyed for cultural resources. Previous studies included the entire area for Drill Sites #1, #2, and #3. There are no known resources on file at the South Central Coastal Information Center or listed on the NRHP or CRHR within Drill Sites #1 and #3. However, the records search results show that one resource overlaps Drill Site #2. Although this resource has been determined eligible for listing, it is not currently listed in the NRHP (ECORP 2022b).

Drill Sites #4, #5, #6, and #7 have not been previously surveyed for cultural resources. There are no previously recorded resources located on these drill sites on file at the South Central Coastal Information Center. In addition, there are no known resources listed on the NRHP or CRHR within these sites.

3.5.2 Regulatory Setting

3.5.2.1 National Historic Preservation Act

Section 106 of the National Historic Preservation Act requires that every federal agency "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places (National Park Service 2012).

3.5.2.2 California Register of Historical Resources: California Environmental Quality Act and California Public Resources Code

The cultural resources provisions of CEQA provide for the documentation and protection of significant prehistoric and historic-era resources. Before the approval of discretionary projects and the commencement of agency undertakings, the potential impacts of the project on archaeological and historical resources must be considered (PRC Sections 21083.2 and 21084.1 and the CEQA Guidelines [CCR Title 14, Section 15064.5]). The significance of an archaeological or historical resource per the CEQA Guidelines is an important consideration in terms of their management. Listing on the California Register of Historical Resources, or eligibility for listing on the California Register of Historical Resources, is the primary consideration in whether or not a resource is subjected to further research and documentation. The significance of cultural resources is measured against the criteria outlined in the California Register of Historic Resources. Determining the California Register of Historical Resources eligibility of historic and prehistoric sites located within the study area is guided by the specific legal context of the site's significance as outlined in PRC Sections 21083.2 and 21084.1 and the CEQA Guidelines (CCR Title 14, Section 15064.5). In the California Register of Historical Resources cultural resources

are defined as buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural, or scientific importance. A cultural resource may be eligible for listing on the California Register of Historical Resources if it:

- a. Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
- b. Is associated with the lives of persons important in our past;
- c. 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
- d. Has yielded, or may be likely to yield, information important in prehistory or history.

The significance of a prehistoric archaeological resource is normally defined relative to criterion (d), and its ability “to yield, information important in prehistory.” This is assessed by the type of information the resource may inform about research questions that explain prehistoric behavior. As a result, the condition or “integrity” of a prehistoric resource is critical; if the resource has been damaged and/or its original horizontal and/or vertical depositional context has been disturbed, it is possible that the ability of that resource to contribute to understanding prehistoric behavior has been compromised.

The significance of an historic-era archaeological resource and/or a built architectural resource is commonly associated with any of the four criteria listed above. Relative to criterion (d), such a resource is not normally considered “important in history” if it is less than 50 years old, given that it would otherwise not be sufficiently unique in terms of its number and distribution. The integrity of an historic-era archaeological resource is also a factor relative to its potential significance, similar to a prehistoric archaeological resource.

As a matter of policy, public agencies avoid damaging effects on historic and archaeological resources, particularly those that are California Register of Historical Resources-eligible. When impacts cannot be avoided, their effects can be mitigated through avoidance during construction phases, incorporation of a site into open space, capping resources with stable fill, deeding a site into a conservation easement, or data recovery through archaeological testing and excavation (CEQA Guidelines Section 15126.4 (b)(3)).

CEQA Guidelines also require consideration of unique archaeological sites (Section 15064.5). If an archaeological site does not meet the criteria for inclusion on the California Register of Historical Resources but does meet the definition of a unique archaeological resource as outlined in the PRC Section 21083.2, it may be treated as a significant historical resource. Treatment options under Section 21083.2 include preserving such resources in place in an undisturbed state. Other acceptable methods of mitigation under Section 21083.2 include excavation and curation, or study in place without excavation and curation if the study finds

that the artifacts would not meet one or more of the criteria for defining a “unique archaeological resource”.

CEQA Guidelines Section 15064.5(e) of the State also requires that excavation activities stop whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the coroner determines that the remains are those of Native Americans, the Native American Heritage Commission (NAHC) must be contacted within 24 hours. At that time, CEQA Guidelines Section 15064.5(d) directs the lead agency to consult with the appropriate Tribe(s) as identified by the NAHC and directs the lead agency (or applicant) to develop an agreement with the Tribe(s) for the treatment and disposition of the remains.

3.5.2.3 California Health and Safety Code Sections 7050.5 and 7052

In accordance with the California Health and Safety Code Sections 7050.5 and 7052, if human remains are uncovered during ground-disturbing activities, all such activities in the vicinity of the find shall be halted immediately, and the City’s designated representative would be notified. SHP’s representative would immediately notify the City planner, county coroner and a qualified professional archaeologist. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (HSC 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the NAHC by phone within 24 hours of making that determination (HSC Section 7050[c]).

3.5.2.4 California Public Resources Code Section 5097.9

The City’s responsibilities for acting upon notification of a discovery of Native American human remains are identified in detail in the California Public Resources Code Section 5097.9. If remains are discovered, SHP would contact the City and the City or its appointed representative and the professional archaeologist shall contact the Most Likely Descendent, as determined by the NAHC, regarding the remains. The Most Likely Descendent, in cooperation with the City, would determine the ultimate disposition of the remains.

3.5.2.5 Signal Hill General Plan

The Environmental Resources Element (1986) of the Signal Hill General Plan addresses cultural resources in goals and policies, as outlined in Table 3.5-1.

Table 3.5-1: Applicable City of Signal Hill General Plan Goals and Policies

Element	Goal	Policy	Applicability
Environmental Resources	Goal 2: Maintain and enhance the City's unique cultural, aesthetic and historic areas.	Policy 2.1: Protect and enhance the State Historical Landmark at the Alamitos Well Site # 1.	Project areas are not located within this historical landmark site and would not impact it.

Element	Goal	Policy	Applicability
		Policy 2.2: Protect and enhance architectural resources in the City consistent with their significance and importance. Develop ways of encouraging these resources to remain intact as the City grows and develops.	CUP drill sites do not contain significant architecture resources, and continued operation of drill sites would not impact architectural resources in the City.

Source: City 1986

3.5.3 Impact Assessment

CUL (a). Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?

Less than Significant. The results of the CHRIS records search indicate that 45 percent of the drill sites have been previously surveyed for cultural resources, with one previously recorded resource located within Drill Site #2. The Lomita Gasoline Company/Petrolane property was determined eligible for listing in the NRHP for local significance under Criteria A and C in 1989. Within the property, the Compressor House is also eligible for listing in the NRHP for local significance under Criterion A.

There are no previously recorded resources located on the other drill sites (Drill Sites #1 and #3 through #7) on file at the South Central Coastal Information Center or listed on the NRHP or CRHR within these sites. Because approximately 55 percent of the drill sites have not been previously surveyed for cultural resources, there may be additional cultural resources that did not appear in either the records search or the review of historic maps and aerial photographs.

Ongoing operations would not require significant new excavation activities and therefore impacts on historical resources would be less than significant. No buildings or other structures are proposed for demolition for the excavation of new well cellars or foundations for the gas plant modification, therefore impacts on historical resources would be less than significant.

CUL (b). Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

Less than Significant with Mitigation Incorporated. Drill Sites #1, #2, and #3 have been previously surveyed for cultural resources. However, approximately 55 percent of the drill sites (Drill Sites #4 through #7) have not been previously surveyed for cultural resources, and there may be additional archaeological resources that did not appear in either the records search or the review of historic maps and aerial photographs.

Continued operations of the drill sites would not require new excavation activities and therefore no impacts on archaeological resources are anticipated.

New Project activities would require excavation during construction for the new well cellars and the foundations for the gas plant modifications, which could result in a potentially significant impact if unanticipated discoveries of archaeological resources occur during ground-disturbing activities associated with well cellar construction and construction of the new LTS system.

Mitigation Measure CUL-1: In the event that any archaeological features are discovered during construction, all work shall stop, and a qualified archaeologist shall be notified. The archaeologist shall record the site and work with the City to identify an alternate location within the boundaries of the drill sites that will avoid impacting cultural resources. The archaeologist shall prepare a report according to current professional standards.

Residual Impacts

Implementation of **MM CUL-1** would reduce potentially significant impacts resulting from inadvertent damage or destruction of unknown historic-era cultural resources during excavation associated with new well cellars required for drilling new wells and installing upgrades to the gas processing plant to a less than significant level.

Implementation of **MM CUL-1** would reduce potentially significant impacts resulting from inadvertent damage or destruction of unknown archaeological resources during continued operations, drilling of new wells, and installing upgrades to the gas processing plant to a less than significant level.

CUL (c). Disturb any human remains, including those interred outside of dedicated cemeteries?

Less than Significant. Due to the previously disturbed nature of the drill sites, encountering and disturbing human remains is unlikely. Ongoing operations would not require new excavation activities and therefore, no impacts are anticipated.

However, if human remains were discovered during excavation activities associated with new well cells or foundations for the gas plant modifications, SHP would implement the protocols discussed in Section 3.5.2 above to ensure impacts would be less than significant. If the discovery includes human remains, the County Coroner must be contacted to implement HSC Section 7050.5 and, if required, PRC Section 5097 et seq.

3.6 Energy

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. ENERGY. Would the project:				
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.6.1 Environmental Setting

3.6.1.1 California's Energy Supplies

Energy capacity, or electrical power, is generally measured in watts while energy use is measured in watt-hours. For example, if a light bulb has a capacity rating of 100 watts, the energy required to keep the bulb on for 1 hour would be 100 watt-hours. If ten 100-watt bulbs were on for 1 hour, the energy required would be 1,000 watt-hours or 1 kilowatt-hour (kWh). On a utility scale, a generator's capacity is typically rated in megawatts, which is one million watts, while energy usage is measured in megawatt-hours (MWh) or gigawatt-hours (GWh), which is one billion watt-hours. The Project Site is within the Southern California Edison (SCE) service area. During 2020, Southern California Edison delivered a total of approximately 103,597 GWh of electricity to its customers (California Energy Commission [CEC] 2022a).

Natural gas is a combustible mixture of simple hydrocarbon compounds (primarily methane) that is used as a fuel source. Natural gas consumed in California is obtained from naturally occurring reservoirs and delivered through high-pressure transmission pipelines. Natural gas provides almost one-third of the State's total energy requirements. Natural gas is measured in terms of cubic feet (cf).

Gasoline is by far the largest transportation fuel by volume used in California. Nearly all the gasoline used in California is obtained through the retail market. In 2022, approximately 13.64 billion gallons of gasoline were sold in California's retail market (CEC 2022c).

Diesel fuel is the second largest transportation fuel by volume used in California behind gasoline. In 2022, approximately 2.29 billion gallons of diesel were sold in California's retail market (CEC 2022c). According to the U.S. Department of Energy's Energy Information Administration, nearly all semi-trucks, delivery vehicles, buses, trains, ships, boats and barges, farm, construction, and military vehicles and equipment have diesel engines.

3.6.1.2 Existing Energy Consumption/Generation

Fuels (i.e., gasoline and diesel), natural gas, and electricity are both generated and consumed as part of SHP's existing and ongoing oil and gas operations occurring at the seven CUP Sites under CUP 97-03.

Fuel: On a typical operating day, employee and contractor vehicles (i.e., automobiles, light- and heavy-duty trucks) travel between the drill sites to conduct routine maintenance, safety inspections, well servicing/testing, and other ancillary activities to ensure the extraction, processing and transmission equipment is operating properly. Specifically, a total of approximately 12 to 14 employees using light-duty vehicles would continue to work at the seven drill sites during the course of normal operating day. Additionally, up to four miscellaneous heavy-duty trucks would also continue to travel to, from, and between the drill sites, as needed, each day. With the exception of additional gasoline consumed during temporary Project construction activities (i.e., construction of the gas system modification at CUP Site #2 and/or new well cellar construction) described in greater detail below, on a permanent basis the Project would not change or increase the total quantity of gasoline fuel consumed in on-road vehicles and work trucks. SHP's heavy-duty vehicles and equipment are powered by diesel. There are two existing permitted aboveground diesel tanks (2,000 gallons total) located at Drill Site #5.

Additionally, minimal quantities of diesel fuel are also consumed as part of SHP's ongoing drilling/re-drilling operations. SHP currently uses two company-owned drilling rigs for their drilling/re-drilling operations, depending on the depth to be drilled. Rig #5 is mostly electrified, however minimal amounts of diesel fuel are required to power the drawworks engine (i.e., 2008 Cameron/Hubbard C-500 drawworks and mast powered by a 450 horsepower (hp) EPA Tier 4 clean burn engine). The remainder of Rig #5's equipment is electrically powered. Note that Rig #6 is fully electrically powered (i.e., no fuel consumed during drilling/re-drilling operations).

Natural Gas: The existing gas processing and turbine power plant located at Drill Site #2 generates electric power directly by recycling natural gas produced at SHP's extraction sites. Specifically, the gas plant processes and removes liquids from the gas produced at SHP's wells covered under CUP 97-03, in addition to produced gas from other local wells operated by SHP and third parties. This electricity is then used to power the drill sites and SHP's other offsite operations to the extent feasible, reducing the need to purchase power from offsite producers. The gas processing plant also allows SHP to collect excess natural gas not consumed onsite for sale directly to third parties through an existing delivery pipeline.

Currently, the majority of produced natural gas is consumed onsite within the power plant at Drill Site #2. Specifically, approximately 70% of the processed natural gas is consumed directly within the onsite power turbine. The remaining quantity of gas produced is sold through the onsite sales meters to the City of Long Beach. In total, SHP's existing operations under CUP 97-

03 produces approximately 79,371 thousand standard cubic feet (“mscf”) of natural gas per year (based upon historical production records from 2010 to 2021), the majority of which is processed within the current natural gas processing facility located at Drill Site #2.

Electricity: The majority of SHP’s existing electricity supply comes directly from the existing gas processing and turbine power plant located at Drill Site #2. Specifically, this existing facility provides 70% of the electricity required to power SHP’s broader oil operations in the Long Beach Oil Field (including those occurring within the seven drill sites). In total, the gas turbine produces approximately 41,383,152 kilowatt-hours (kWh) annually (based upon data collected during 2020), while approximately 12,414,946 kWh of additional electrical power is purchased from SCE per year. Because the electricity generating facility is powered directly by natural gas produced by SHP’s extraction sites, this reduces SHP’s need to purchase offsite power.

3.6.2 Regulatory Setting

3.6.2.1 Corporate Average Fuel Economy Standards

Congress enacted the Corporate Average Fuel Economy standards in 1975 to reduce energy consumption and increase the fuel economy of cars and light trucks. Corporate Average Fuel Economy standards are regulated by the Department of Transportation National Highway Traffic and Safety Administration and the USEPA calculates fuel economy levels and sets related GHG standards. Fuel efficiency standards for medium- and heavy-duty trucks have been jointly developed by USEPA and National Highway Traffic and Safety Administration. The Phase 1 heavy-duty truck standards apply to combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles for model years 2014 through 2018, and result in a reduction of CO₂ emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of vehicles. USEPA and National Highway Traffic and Safety Administration have also adopted the Phase 2 medium- and heavy-duty vehicles standards, which cover certain trailers for model years 2018 through 2027 and semi-trucks, large pickup trucks, vans, and all buses and work trucks with model years 2021 through 2027. These standards are expected to lower CO₂ emissions by approximately 1.1 billion metric tons and reduce oil consumption by up to two billion barrels over the lifetime of the vehicles (DOT 2014, USEPA 2022a). The vehicles used by SHP comply with these standards.

3.6.2.2 Energy Policy Act of 2005

The Energy Policy Act of 2005 addresses energy production in the U.S, including energy efficiency; renewable energy; oil and gas; coal; tribal energy, nuclear matters and security; vehicles and motor fuels; hydrogen; electricity; energy tax incentives; hydropower and geothermal energy; and climate change technology. A provision of the Energy Policy Act is that it provides loan guarantees for entities that develop or use innovative technologies to avoid

production of greenhouse gases. It also increases the amount of biofuel that must be mixed with gasoline sold in the U.S. (USEPA 2022b).

3.6.2.3 Senate Bill 1389

SB 1389 (PRC Sections 25300–25323) requires the California Energy Commission (CEC) to prepare a biennial integrated energy policy report to assess major energy trends and issues facing the state’s electricity, natural gas, and transportation fuel sectors and provide policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state’s economy; and protect public health and safety (PRC Section 25301[a]). CEC’s 2021 Integrated Energy Policy Report provides findings and recommendations for energy issues facing the state, including energy efficiency and reliability, decarbonizing buildings and California’s natural gas system, forecasting California’s energy demand, and quantifying the benefits of clean transportation programs, such as California’s transition to zero-emission vehicles. The 2021 report also provides trend updates for California’s sources of crude oil and nuclear plants (CEC 2021).

3.6.2.4 Senate Bill 350, Clean Energy and Pollution Reduction Act

SB 350 established clean energy, clean air, and GHG reduction goals, which included reducing GHGs to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050. The CEC works with other state agencies, including the California Public Utilities Commission, CARB, and the California Independent System Operator to implement this bill. SB 350 increases the state’s renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030, which will increase the use of Renewables Portfolio Standard eligible resources including solar, wind, biomass, geothermal, and others. In addition, California is required to double statewide energy efficiency savings in electricity and natural gas end uses by 2030. To meet these goals and reduce GHG emissions, the CEC will require large utilities to develop and submit integrated resource plans, which detail how utilities will meet their customers’ resource needs, reduce GHG emissions, and increase clean energy resource use (CEC 2022b).

3.6.2.5 CARB Heavy-Duty On-Road and Off-Road Vehicle Regulations

In 2004, CARB adopted an Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling to reduce public exposure to DPM emissions (Title13 California Code of Regulations Section2485). The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. This measure does not allow diesel-fueled commercial vehicles to idle for more than five minutes at any given location. While the goal of this measure is primarily to reduce public health impacts from diesel emissions, compliance with the regulation also results in energy savings in the form of reduced fuel consumption from unnecessary idling.

In addition to limiting exhaust from idling trucks, CARB also promulgated emissions standards for off-road diesel construction equipment greater than 25 horsepower (hp) such as loaders, backhoes, and forklifts, as well as many other self-propelled off-road diesel vehicles. The In-Use Off-road Diesel-Fueled Fleets regulation adopted by CARB on July 26, 2007, encourages the retirement, replacement, or repower of older engines with newer emissions-controlled models (13 CCR Section 2449). The compliance schedule requires full implementation by 2023 in all equipment for large and medium fleets and by 2028 for small fleets. While the goal of this measure is primarily to reduce public health impacts from diesel emissions, compliance with the regulation has shown an increase in energy savings in the form of reduced fuel consumption from more fuel-efficient engines.

3.6.2.6 [Assembly Bill 1575](#)

AB 1575 was adopted in 1975 by the California State Legislature and amended Public Resources Code Section 21100(b)(3) to require EIRs to consider the wasteful, inefficient, and unnecessary consumption of energy resources caused by a project. Since the passage of AB 1575, the California Natural Resources Agency finalized updates to the CEQA Guidelines in December 2018. New CEQA Guidelines Section 15126.2(b) treats “wasteful, inefficient, or unnecessary” energy consumption as a significant environmental impact.

3.6.2.7 [Assembly Bill 1493](#)

AB 1493 was passed in 2002 in response to the transportation sector accounting for a majority of California’s GHG emissions. It requires CARB to adopt regulations and set GHG emission standards for new passenger vehicles, light-duty trucks, and other vehicles manufactured in and after 2009 whose primary use is non-commercial personal transportation. Phase 1 of the legislation established standards for model years 2009 through 2016 and Phase 2 established standards for model years 2017 through 2025 (CARB 2022c).

3.6.2.8 [Signal Hill General Plan](#)

The Environmental Resources Element (1986) of the Signal Hill General Plan generally addresses resource conservation issues, including for energy, in goals and policies as outlined in Table 3.6-1. The City of Signal Hill is currently in the process of updating the Environmental Resources Element of the General Plan. The Land Use Element (2001) includes an implementation measure for its goals/policies which is related to energy.

Table 3.6-1: Applicable City of Signal Hill General Plan Goals and Policies

Element	Goal	Policy	Applicability
Environmental Resources	Goal 7: Maintain and provide information to the community on environmental	Policy 7.1: Disseminate information about the values of alternative energy technology, including use of solar energy in Signal Hill.	Most General Plan policies, goals, and implementation measures related to energy are general in nature. These

Element	Goal	Policy	Applicability
	problems, opportunities, progress and issues.	Policy 7.2: Develop a public information program in conjunction with the oil production industry to explain programs and progress toward improving the resource production/urban development interface.	policies are potentially applicable to the Project.
Land Use	Implementation Measure 51 for Goals/Policies	The City will consider adopting energy conservation regulations consistent with state law and local needs.	The Project area would be subject to City regulations.

Source: City 1986, 2001

3.6.2.9 Signal Hill Sustainability Programs

The City implements a variety of programs and frameworks meant to promote sustainable practices including those related to reduced fossil fuel consumption and increased use of renewable energy sources. The City supports Energy Upgrade California, which is a statewide initiative which encourages people to integrate energy management practices into their daily lives. Signal Hill urges residents and small businesses to become more conscious about energy use. Specific sustainability policies promoted by the City include the following: Municipal Green Building, Electrical Vehicle Charging Station, and the Sustainable Purchasing policies (City 2022a). The goals and policies outlined within the City’s sustainability programs are generalized and not specific to the Project. However, the Project would continue to incorporate energy saving infrastructure and operational procedures as feasible, to reduce the existing and future energy consumption associated with CUP 97-03, as applicable and required by City regulations.

3.6.3 Impact Assessment

ENG (a). Would the Project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less than Significant. SHP would continue their existing operations at the current activity level for the duration of the CUP extension. In addition to ongoing operations, as described in Section 2, as part of the new Project activities, SHP proposes to install upgrades to the natural gas processing facility at Drill Site #2 to promote efficiency and redundancy in operations. The equipment modifications, as specifically described in Section 2 of this document, would include installation of the following equipment: (1) a sales gas booster compressor; (2) a redundant LTS unit; (3) a redundant CO₂ capture and sequestration unit (“CO₂ unit”); and, (4) a Cimarron certified ultra-low emissions “CEB 800” burner. The redundant LTS and CO₂ units would allow the gas processing facility to remain online during intermittent periods of maintenance or repairs. Additionally, operating the old and new units in parallel would also increase the efficiency of the facility. The new LTS unit would be sized for handling 2,000 mcf per day of

natural gas each and would be installed contiguous to the existing equipment. The membrane unit will be sized to process 1,500 mcf per day. In addition, the CEB 800 burner uses proprietary technology for ultra-low emission combustion of waste gas streams (99.9% VOC destruction). The current gas facility operation generates a low volume high British Thermal Unit (BTU)/high VOC waste gas stream that currently has to be cycled back through the processing facility, which frequently causes process upsets. Diverting the waste gas stream to the CEB 800 burner would improve overall plant operation, efficiency, and reliability. Further, SHP would continue to offset approximately 70 percent of their energy consumption through production of electricity at natural gas-powered turbine/electric generation facility located at CUP Site #2. The electrical generation facility is powered by natural gas produced by SHP’s extraction sites, which reduced SHP’s need to purchase offsite power.

For drilling of new wells, SHP currently uses two rigs for their operations, depending on the depth to be drilled. The lighter-duty drilling rig is SHP’s Rig #5. This rig has a 2008 Cameron/Hubbard C-500 draw-works and mast powered by a 450 hp USEPA Tier 4 engine. The remainder of Rig #5’s equipment is electrically powered. SHP’s Rig #6 is a heavier-duty drilling rig with a 1,000 hp electrically powered draw-works motor. All of Rig #6’s equipment is electrically powered. As described in Section 2, SHP has confirmed the diesel Rig #5 is only utilized 10% of the time during drilling/redrilling, while the all-electric Rig #6 would continue to be utilized for 90% of future drilling/redrilling operations, and if the Project is approved, this would be made a condition of approval of the CUP.

Accordingly, the Project would consume fuel energy (diesel and gasoline) in the form of off-road equipment activity (construction equipment) and on-road vehicular traffic (i.e., delivery trucks, contractor vehicles) during construction of the gas system modifications at Drill Site #2, as well as construction of new well cellars on an as needed basis. Construction of the gas system modification is expected to take up to six months to complete and would involve the use of various pieces of onsite construction equipment as well as employee/contractor trucks and vehicles travel to and from Drill Site #2. Tables 3.6-2 and 3.6-3 summarize the applicable off-road construction equipment and associated activity levels, as well as the on-road vehicle trip rates. In instances where Project-specific information was not available, default values described in the appendices of the California Emissions Estimator Model (CalEEMod) User Guide are utilized (see the calculations sheets in Appendix F for additional detail).

Table 3.6-2: Project Construction Off-Road Equipment Activity Summary

Equipment	Total Operating Hours	Horsepower (Hp)	Load Factor (LF)
Gas System Modification			
Backhoe	40	97	0.37
Dump Truck	32	402	0.38

Equipment	Total Operating Hours	Horsepower (Hp)	Load Factor (LF)
Water Truck	40	402	0.38
Crane	104	231	0.29
Welder	144	46	0.45
Concrete/Pavement Saw	16	81	0.73
Ready-Mix Concrete (RMC) Truck	64	402	0.38
Well Cellar Construction			
Backhoe	80	97	0.37

Notes: See Appendix D and F for additional details.

Table 3.6-3: Project Construction On-Road Equipment Activity Summary

On-Road Vehicle Type	Round Trips per Day	Miles per Trip	Total Operating Days	Total VMT
Gas System Modification				
Contractor/Gear Trucks	6	3	48	864
Heavy-Duty Trucks (Equipment/Deliveries)	2	5	48	480
Ready-Mix Concrete (RMC) Trucks	2	10	173	3,460
Well Cellar Construction				
Employee/Contractor Trucks	2	3	20	120
Heavy-Duty Trucks (Equipment/Deliveries)	1	5	20	100

Notes: See Appendix D and F for additional details.

Off-road equipment fuel usage during the Project activities described above were calculated using the Project-specific information summarized above, applicable assumptions/default values obtained from CalEEMod, and the fuel usage calculations provided in the 2017 Off-Road Diesel Emission Factors spreadsheet, prepared by CARB (2021). CARB’s spreadsheet provides the following formula to calculate fuel usage from off-road equipment activity:

$$Fuel\ Used\ (gal) = Load\ Factor\ (LF) * Horsepower\ (Hp) * Total\ Operating\ Hours * \frac{BSFC}{Unit\ Conversion}$$

Where:

Load Factor (LF): Obtained from CalEEMod default values.

Horsepower (hp): Obtained from CalEEMod default values.

Total Operational Hours: Project-specific information/activity levels provided by SHP.

BSFC: Brake Specific Fuel Consumption (pounds per horsepower-hour) = 0.408 lb/hp-hr

Unit Conversion: Convert pounds to gallons = 7.109 lb/gal

Using the above formula and the activity levels summarized in Table 3.6-2, Table 3.6-4 below summarizes the estimated total fuel consumed by off-road equipment during construction of both the gas system modification and new well cellars, as well as future drilling/redrilling using Drill Rig #5. As shown, the off-road equipment is estimated to consume approximately 69,007 gallons of total fuel energy, of which an estimated 1,900 gallons would be consumed during temporary construction of the gas system modification, up to 165 gallons would be consumed as a result of well cellar construction, and approximately 66,942 would be consumed during drilling/redrilling with Drill Rig #5 during the of the life of the Project.

The Project’s on-road construction-related vehicle trip fuel usage associated with the gas system modification and well cellar construction was also calculated using the on-road vehicle activity levels summarized in Table 3.6-3 above. For instances where Project-specific information was unavailable, assumptions/default values from CalEEMod were utilized. Using this data, along with the fleet average miles per gallon rates calculated using CARB’s EMFAC model (see Appendix C), total on-road fuel consumption was calculated (CARB 2021). Table 3.6-4 shows the on-road construction vehicle trips and the associated fuel usage calculations. In total, on-road construction-related vehicle trips are estimated to consume a total of 1,108 gallons of fuel, of which an estimated 1,071 gallons would be consumed during temporary construction of the gas system modification, and up to 37 gallons would be consumed as a result of well cellar construction of the life of the Project.

Table 3.6-4: Project Fuel Consumption

Project Activity/Construction Phase	Off-Road Equipment Fuel Consumption (gallons)	On-Road Vehicle Fuel Consumption (gallons)
Gas System Modification	1,900	1,071
Well Cellar Construction (20-year term of CUP)	165	37
Drilling/Redrilling (Drill Rig #5) ^a	66,942	N/A
Total Fuel Consumed (gallons):	69,007	1,108

Notes: See Appendix D and F for additional details.

^a Note, the existing onsite employees/employee vehicles would conduct drilling/redrilling during the course of their typical/ongoing workdays. Because there would be no change in on-road vehicle activity during drilling/redrilling, no additional fuel would be consumed.

In total, based upon the information and assumptions summarized above, construction of the Project is estimated to consume a total of 70,115 gallons of additional fuel energy. The Project would be required to comply with the CARB anti-idling and emissions regulations that require that equipment not used for more than five minutes be turned off would result in energy conservation as well as the USEPA and CARB engine emission standards that require highly efficient combustion systems to maximize fuel efficiency and reduce unnecessary fuel consumption.

Further, the Project would neither generate nor consume additional quantities of natural gas beyond those currently associated with SHP’s existing operations. While the proposed modifications at Drill Site #2 will give SHP greater operational flexibility and back-up capacity for its critical gas processing equipment, it would not increase the total quantity of natural gas produced at the drill sites. Further, the production from any new wells drilled would allow SHP to maintain current production levels from the drill sites, as production in existing wells naturally declines over time. The recently constructed sales outlet for Southern California Gas Company on Drill Site #2, provides another outlet for sale of the produced natural gas but has no effect on production levels. As such, no additional natural gas energy resources would be consumed as a result of the Project.

Minimal quantities of additional electricity energy resources may be required to operate the gas system modification system. Specifically, the new LTS and backup membrane units would be electrically powered and would therefore consume an additional quantity of electricity. The Project property, including the gas system at Drill Site #2, would continue to be powered by SHP’s existing onsite power turbine, with supplemental power provided by Southern California Edison. While the gas system modification would consume electric energy on an ongoing basis, this additional consumption is expected to be minimal. Additionally, installation of the redundant LTS and membrane units will ensure the facility can maintain safe operations during periods of maintenance of repairs, which in turn would ensure the gas turbine can continue to operate at full capacity. Any minimal quantity of additional electricity consumed by the new LTS and membrane system during ongoing operations is expected to be offset by the increased efficiency of the existing onsite power turbine.

The Project would also consume electricity due to future drilling/redrilling using the all-electric Drill Rig #6. The total quantity of electrical energy consumed within Drill Rig #6 was estimate for the life of the Project, assuming 90% of the total 46 new wells would be drilled and 28 existing wells would be redrilled using Drill Rig #6 over the 20-year life of the Project. Following construction of each new well head, operation of the pumpjacks would also require an additional quantity of electricity. As such, additional electricity required to power 46 new pumpjacks was also accounted for. In total, Project operations are expected to require 6,416,897.6 kWh of additional electricity usage per year as summarized in Table 3.6-5.

Table 3.6-5: Project Electricity Consumption

Project Activity/Operation	Annual Maximum kWh
Drilling/Redrilling (Drill Rig 6)	4,783,814.6
New Pumpjacks	1,633,083.0
Total Electricity Consumed (kWh):	6,416,897.6

Notes: See Appendix D and F for additional details.

In 2021, the total annual electricity consumption in Los Angeles County for the non-residential sector is reported to be 44,438,000 MWh (i.e., 44,438 GWh) (CEC 2023). Accordingly, operation of the wells would represent approximately 0.014 percent of the total electricity consumption in Los Angeles County. No new sources of electricity would be needed to meet the Project's energy needs.

As stated above, there are no unusual Project characteristics or processes involved during construction or operations that would require the use of equipment or vehicles that would be more energy intensive than is used for comparable activities (including SHP's existing operations), or the use of equipment that would not conform to current emissions standards and related fuel efficiencies. Additionally, as required by the City, SHP would continue to utilize water and energy efficiency features as applicable, including water efficient landscaping, LED light fixtures, and other facility features meant to reduce energy use. In addition, development of the gas system modification would ensure SHP's existing natural gas turbine/power station could continue to function efficiently, further reducing SHP's carbon footprint and adding to its sustainability (i.e., reduced SHP's need to purchase offsite power). For these reasons, the construction and operation activities associated with the proposed Project (i.e., gas system modification, well cellar construction, and operation of new wells) would not require the creation of a new source of energy, and continued compliance with applicable state and local requirements would ensure the Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources.

Lastly, both existing and future equipment and vehicles used by Project workers and vendors would be subject to increasingly stringent federal and state fuel efficiency standards, which would minimize the potential for inefficient fuel usage. The Project would be required to comply with the provisions of 13 CCR Sections 2449 and 2485, which prohibit diesel-fueled commercial motor vehicles and off-road diesel vehicles from idling for more than five minutes. Heavy equipment would also be subject to the USEPA's Construction Equipment Fuel Efficiency Standard (40 CFR Parts 1039, 1065, and 1068) and CARB's AB 1493 (i.e., Pavley) regulations, which would also minimize inefficient fuel consumption and ensure that the fuel efficiency of equipment and vehicles operating on- and off-site would continue to improve over time. In the interest of cost efficiency and in accordance with federal and state requirements, SHP's onsite staff and third-party vendors would not utilize fuel in a manner that is wasteful or unnecessary during Project construction and operation phases.

For the reasons outlined above, the proposed Project would not result in a potential impact due to wasteful, inefficient, or unnecessary consumption of energy resources, and impacts would be less than significant with no mitigation required.

ENG (b). Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less than Significant. As discussed above, in the case of energy impacts assessment in the City of Signal Hill, there is not yet a specific threshold of significance. At this time, other than the generalized policies found within the General Plan, the City has not adopted local programs or policies that support energy efficiency and/or sustainability that would apply to the Project.

As discussed under Impact Criteria ENG (a) above, the Project's mobile equipment and vehicles, including Drill Rig #5 which currently has a Tier 4 diesel engine, would also comply with federal, state, and regional requirements where applicable. Specifically, the USEPA and the NHTSA have adopted fuel efficiency standards for medium- and heavy-duty trucks which apply to truck fleet operators, such as the Project proponent. CARB has also adopted cleaner technology and fuel standards pursuant to AB 1493. While Phase 1 and Phase 2 regulation published by both the USEPA/NHTSA and CARB primarily apply to manufacturers of on-road vehicles and not the end user, SHP and off-site vendors will ensure engines purchased are certified in accordance with the appropriate state and federal regulations. This will ensure that efficiency of mobile equipment and vehicles would continue to improve over the 20-year life of the Project through compliance with increasingly stringent standards adopted by applicable regulatory agencies. The energy modeling for trucks does not account for specific fuel reductions from these regulations, as they would apply to fleets as they incorporate newer trucks meeting the regulatory standards; however, these regulations would have an overall beneficial effect on reducing fuel consumption from trucks over time as older trucks are replaced with newer models that meet the standards.

The State of California's Energy Efficiency Strategic Plan (adopted 2008, updated January 2011) outlines specific goals and strategies to help promote energy efficiency in California's industrial sector in three (3) areas: 1) Support industry adoption of energy efficiency by integrating energy efficiency savings with achievement of GHG goals; 2) Build market value of and demand for energy efficiency; and 3) Provide technical and public policy guidance for resource efficiency (CPUC 2011). The Energy Efficiency Strategic Plan promotes reductions in energy consumption through compliance with GHG emission reductions, water conservation, and proper waste disposal. As applicable, the Project would continue to utilize the best available equipment to improve diesel fuel efficiency, and equipment that uses energy would implement modern design and technology to maximize efficiency improvements.

Lastly, the Project is expected to have no effect on local population growth, as the Project would require no additional permanent onsite employees, and the Energy Efficiency Strategic Plan contains no additional control measures with which the Project may conflict. As discussed above, other than temporary additional contractors and vendors required to construct the gas system modification (estimate to be completed in 6 months), SHP's 12 to 14 existing onsite employees would continue to work at the drill sites, and no additional employees would be

required. Additionally, the Project would continue implementing existing rules and conform with fleet turnover, further reducing the Project’s fuel energy consumption over time.

In summary, the Project construction and operations activities would not result in significant increase in energy consumption over the existing environmental baseline and would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, the Project impacts are less than significant, with no mitigation required.

3.7 Geology and Soils

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GEOLOGY AND SOILS. Would the project:				
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.7.1 Environmental Setting

3.7.1.1 Geology and Soils

The City of Signal Hill is located in the Peninsular Ranges Geomorphic Province within an area known as the Los Angeles Coastal Plain. Signal Hill is a surface expression of the northwesterly Newport-Inglewood structural fault zone and is underlain by thousands of feet of marine and nonmarine sediments that rest above metamorphic basement rock. The current surface expression of the area consists of Holocene- and Pleistocene-age sediments. Generally, the sediments present in Signal Hill are composed of weathered alluvium and are classified as silts and sands (City 1986). The dominant geologic unit is comprised of old paralic (interfingered) deposits consisting primarily of silt and sand with scattered gravel and fossiliferous lenses, capped locally with a reddish-brown weathered (soil) zone of clayey silt to clayey sand. This unit is described as potentially corrosive to concrete, having limited expansion potential, and moderate expansion potential in clayey sections (City 2016). The remainder of Signal Hill consists of young alluvial floodplain deposits composed mostly of soft clay, silt and loose to moderately dense sand and silty sand as well as coarser-grained young alluvial fan and valley deposits composed of clay, sand, gravel, and cobbles. These units have localized areas of moderate to high expansion potential and are considered to have a higher potential for liquefaction. Areas mapped as these units are those areas which the CDOC mapped as liquefaction zones. All the drill sites are situated within the paralic deposits (City 2016). The geologic units designated in Signal Hill are shown in Figure 3.7-1 and described in Table 3.7-1.

Table 3.7-1: Geologic Units in Signal Hill

Unit	Description
Qop	Old paralic deposits (late to middle Pleistocene; include the Lakewood Formation, terrace deposits, and Palos Verdes sand) – In the Signal Hill area, these are composed primarily of silt and sand with scattered gravel and fossiliferous lenses, capped locally with a reddish-brown weathered (soil) zone of clayey silt to clayey sand. These interfingering strandline, beach, estuarine, and colluvial deposits are mostly poorly sorted, moderately permeable, and medium dense to dense. The silt and sand sections, where exposed in slope faces, are susceptible to erosion and surficial slumping; the clayey sections may have a moderate expansion potential. May be corrosive to concrete.
Qya	Young alluvial floodplain deposits (Holocene and Late Pleistocene) – Composed mostly of soft clay, silt and loose to moderately dense sand and silty sand. These deposits are mostly poorly consolidated, poorly sorted, and permeable, and therefore potentially susceptible to liquefaction and differential settlement. Locally, these deposits may have a moderate to high expansion potential.
Qyfa	Young alluvial fan and valley deposits (Holocene and Late Pleistocene) – Composed of clay, sand, gravel and cobbles. These deposits are mostly poorly consolidated and poorly sorted, and are therefore compressible, potentially susceptible to collapse, liquefaction, and seismically-induced differential settlement. Locally, these deposits may have a moderate to high expansion potential.
Not mapped	Artificial fill (compacted and uncompacted) – deposits of various thicknesses are known to occur locally in the Signal Hill area but are not mapped in the General Plan. These deposits are typically associated with petroleum exploration and drilling activities, grading, and construction. Fills impacted with petroleum hydrocarbons and heavy metals may be encountered in areas that were previously part of an oilfield. These deposits are mostly poorly consolidated, poorly sorted, potentially compressible, and may have a moderate to high expansion potential.

Source: City 2016

3.7.1.2 Faulting and Seismicity

The City of Signal Hill is located in a seismically active region, and major regional faults create the risk of substantial earth shaking and potential ground rupture in the area. Within Los Angeles County, there are over 50 active and potentially active fault segments, an undetermined number of buried faults, and at least four blind-thrust faults capable of producing damaging earthquakes. Earthquakes and associated ground shaking present a multitude of potentially dangerous consequences that can include ground rupture, ground failure, liquefaction, and landslides.

The California Geological Survey defines an active fault as a fault showing evidence for activity within the last 11,000 years. The Newport-Inglewood Fault System is a seismically active system that cuts diagonally across Signal Hill. This fault is the most significant seismic feature in the area and contains five faults which are within or in the immediate vicinity of Signal Hill, four of which are active or potentially active (Cherry Hill, Pickler, Northeast Flank, and Reservoir Hill faults) (City 2016) as shown in Figure 3.7-2. The Newport-Inglewood Fault System is designated as an Alquist-Priolo fault zone (City 2016). Drill Sites #4 through #7 are located within an Alquist-Priolo fault zone. Drill Sites #1, #2, and #3 are not located within an Alquist-Priolo fault zone (CDOC 2021).

The CDOC maps earthquake hazard zones, which are defined areas subject to the following three types of geologic ground failures: (1) fault rupture, where the surface of the earth breaks along a fault; (2) liquefaction, in which the soil temporarily turns to quicksand and cannot support structures; and, (3) earthquake-induced landslides (CDOC 2021).

As shown in Figure 3.7-3, limited areas within the City of Signal Hill pose potential seismically-induced landslide and liquefaction risks. None of the drill sites are located within a liquefaction zone. A small portion of Drill Site #5 is located within a seismically induced landslide zone. None of the other drill sites are located within areas susceptible to seismically induced landslides (CDOC 2021, City 2016).

3.7.1.3 Landslides

Unstable hillslopes are areas susceptible to landslides. Landslides consist of the downslope movement of soil and rock under the influence of gravity. The geologic and topographic features of the landscape are the primary determinants of the shear strength of the hillslope materials (i.e., resistance to landslides) and hillslope shear stress (i.e., propensity for landslides). Landslides occur when the shear stress exceeds the shear strength of the materials forming the slope (Highland and Bobrowsky 2008). The best indicator of high landslide potential is evidence of previous landsliding (Highland and Bobrowsky 2008). Landslides can be classified as active or dormant, based on how recently they have moved. Active landslides typically display cracks or sharp, bare scarps. Vegetation is usually sparser on active landslides than on adjacent stable ground, and if trees are present, they are usually leaning, indicating that ground movement has occurred since they became established. Dormant landslide features have typically been modified by weathering, erosion, and vegetative growth and succession. Active landslides are generally more unstable than dormant landslides and may require mitigation measures to avoid mobilization. Excavation, the use of heavy equipment, soil saturation, or the removal of root support can mobilize active landslides. Although dormant landslides are less likely to be mobilized by human activities, portions of dormant landslides (e.g., their steep headwalls and margins) are often unstable.

As shown in Figure 3.7-3, areas that are susceptible to landslides are in areas of higher elevation within Signal Hill. The City was most recently impacted in 1998 when a portion of steep, unstable natural slope below Panorama Drive eroded due to heavy El Niño rains (City 2016). As stated in the City General Plan Safety Element (2016), no significant landslide events have occurred in the City of Signal Hill since the adoption of the 2012 Mitigation Plan. There are two remaining areas with landslide potential in the City, one is located north of Panorama Drive and the other is located southwest of Sunset View Park (City 2016). A small portion of Drill Site #5 is located immediately adjacent to a seismically induced landslide zone and within an area of undeveloped land with landslide potential. None of the other drill sites are located within areas susceptible to seismically induced landslides or within a liquefaction zone (CDOC 2021, City 2016).

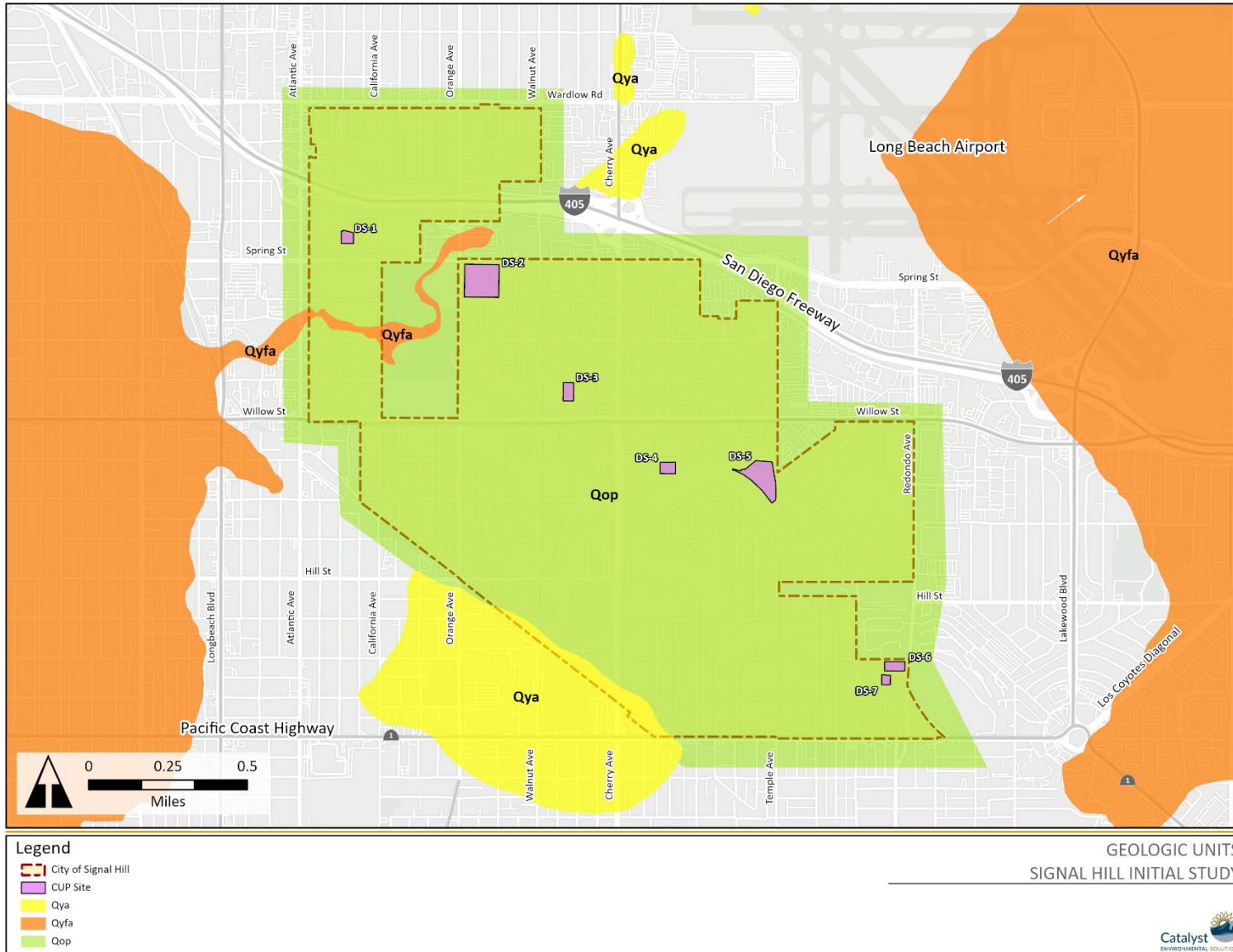


Figure 3.7-1: Geologic Units Designated in Signal Hill

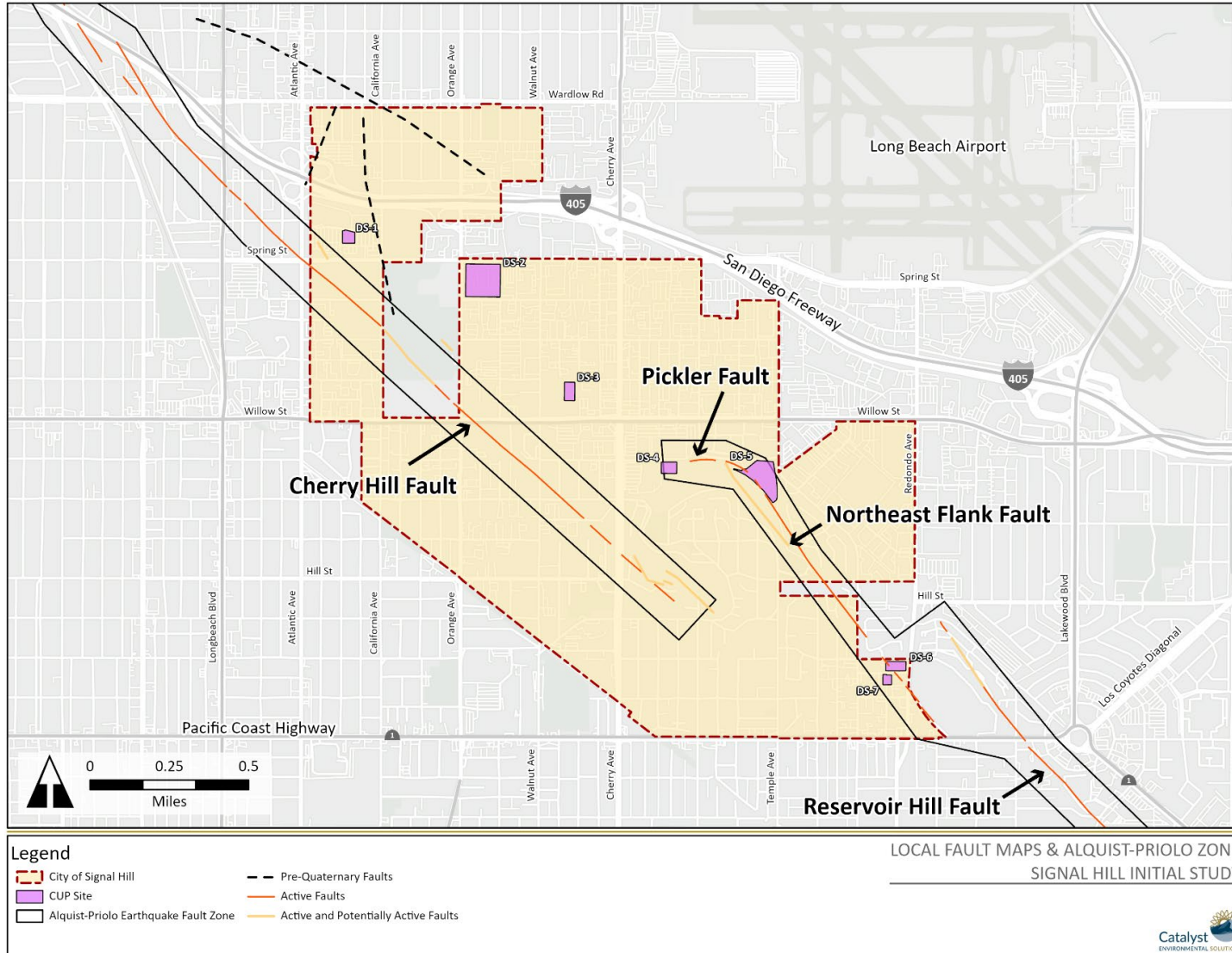


Figure 3.7-2: Designated Fault Zones in Signal Hill

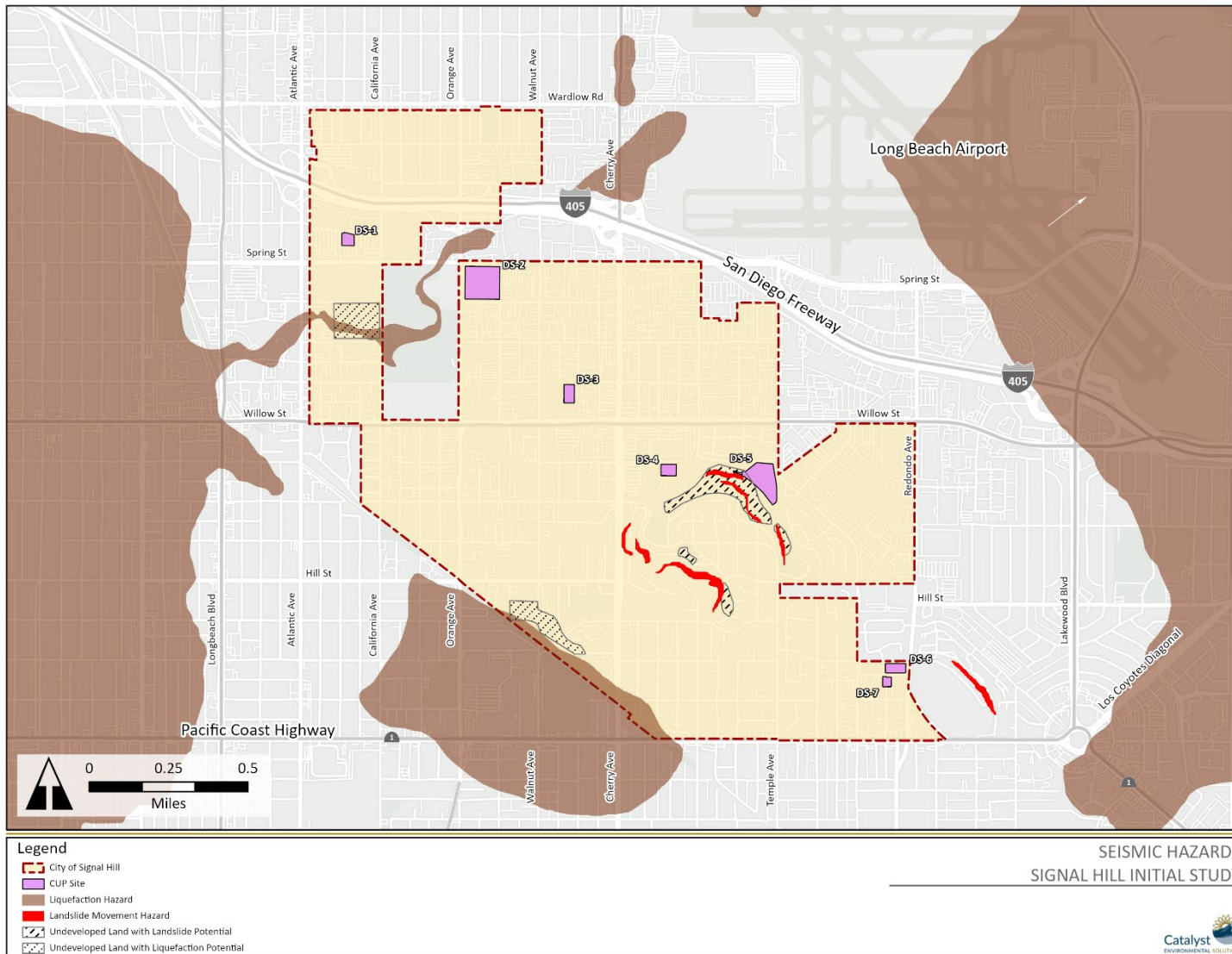


Figure 3.7-3: Liquefaction and Landslide Movement Hazards in Signal Hill

3.7.1.4 Subsidence

Subsidence is the sinking or gradual lowering of the earth's surface. Natural geologic causes of subsidence include basin-downwarp, fault movement, sediment compaction, and relaxation of deep earth stresses. Man-made causes include groundwater pumping, mining, oil and gas production, river channelization, and surface loading (City 2016).

Subsidence is the motion of the Earth's surface as it shifts. Ground subsidence has been a concern in certain oil fields where petroleum reserves have been removed and not replaced.

The Port of Long Beach area experienced significant subsidence historically, primarily due to oil and gas extraction in the Wilmington Oilfield (City 2016). Subsidence occurred in the Long Beach/Wilmington area associated with production of the Wilmington Oil Field. Oil has been produced from five major sand intervals ranging in depths from 2,000 feet to 11,000 feet where over two and one-half billion barrels of oil have been recovered. To address subsidence, in the 1950s and 1960s, the City of Long Beach successfully tested waterflooding and repressuring operations, which halted the subsidence and mostly stabilized surface elevations (Baghdikian et al. 2010). To prevent further subsidence, water was injected into areas where oil was removed. The City of Long Beach instituted a water injection volume equal to 105% of the total volume of produced fluids (oil, gas, and water) to prevent further reservoir compaction and subsidence (Baghdikian et al. 2010). The maximum elevation loss was 29 feet, which created a land surface "subsidence bowl", the extent of which affected the Signal Hill area by up to 2 feet as shown in Figure 4.7-4 (Baghdikian et al. 2010, City of Long Beach 2022).

CUP Sites #5, #6, and #7 are located within the portion of Signal Hill that was affected by the identified subsidence up to 2 feet, and the other drill sites are located outside the affected area. Surface elevation is monitored annually in the City of Long Beach, which found that elevations throughout the Alamitos Bay, Naples, Central City, Civic Center, the offshore islands, and the City of Long Beach north of the Wilmington Oil Field (area closest to Signal Hill drill sites) were stable during the 12-month period of November 2020 through November 2021 (City of Long Beach Energy Resources Department 2021).

Signal Hill Petroleum extracts oil and gas from the Long Beach Oil Field. The Wilmington Oilfield is located deeper underground than the Long Beach Oilfield (within which the drill sites are located) and, as such, Signal Hill is not subject to the same subsidence concerns as the Port of Long Beach area (City 2016). Compared to the Wilmington Oil Field, the Long Beach Oil Field is produced from shallower depths (up to 7,500 feet), and substantially less water is produced. However, as part of current operations for the CUP sites, SHP employs the same strategy of injecting water into the oil formation, which minimizes the risk of future subsidence resulting from oil extraction in Signal Hill (City 2016). All injection activities are conducted in accordance with SHP's approved Class II Underground Injection Control permit and CalGEM updated Underground Injection Control regulations (adopted April 2019), which requires that injected fluids are confined both vertically and horizontally to the intended formation and which

specifies both the total volume of fluid that may be injected and the rate at which injection may occur.

3.7.1.5 Paleontological Resources

The majority of the City of Signal Hill is underlain by old paralic deposits of late to middle Pleistocene age which have the potential to include paleontological resources as marine mollusks have been observed in these deposits in Signal Hill (PCR 2017). Accordingly, excavations into these deposits have the potential to encounter paleontological resources.



Figure 3.7-4: Extent of Subsidence Bowl through 1970

3.7.2 Regulatory Setting

3.7.2.1 Alquist-Priolo Earthquake Fault Zoning Act, California Public Resources Code Sections 2621– 2630

The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) (PRC Sections 2621–2630) was passed in 1972 to reduce the hazard of surface faulting on structures designed for human

occupancy. The main purpose of the law is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The law addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as Earthquake Fault Zones around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning efforts. Before a project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, cities and counties must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults. Because the Project would not involve the construction of any buildings, Project activities are not subject to permitting approvals based on this act.

3.7.2.2 California Public Resources Code

PRC, Chapter 1.7, Sections 5097.5 and 30244, include additional state level requirements for the assessment and management of paleontological resources. These statutes require reasonable mitigation of adverse impacts to paleontological resources resulting from development on state lands, define the removal of paleontological “sites” or “features” from state lands as a misdemeanor, and prohibit the removal of any paleontological “site” or “feature” from state land without permission of the jurisdictional agency. These protections apply only to State of California land; therefore, this is not applicable to the Project which would occur on private land.

3.7.2.3 Seismic Hazards Mapping Act

The only hazards addressed by the Alquist-Priolo Fault Zoning Act are those related to surface fault rupture, not other earthquake hazards. As such, the state passed the Seismic Hazards Mapping Act in 1990 to address non-surface rupture seismic hazards, which include liquefaction, landslides, and strong seismic ground shaking. Under the Seismic Hazards Mapping Act, the State Geologist is required to identify and map the locations of these secondary seismic hazards (CDOC 2019).

3.7.2.4 Signal Hill General Plan

The Safety Element (2016) of the Signal Hill General Plan address geology in goals and policies, as outlined in Table 3.7-2.

Table 3.7-2: Applicable City of Signal Hill General Plan Goals and Policies

Element	Goal	Policy	Applicability
Safety	Goal 1: Prevention: Strive to prevent man-made disasters and minimize the potential	Policy 1.d: Maintain, revise, and enforce appropriate standards and codes to minimize seismic and geologic risks.	The Project would continue to be subject to all previous regulations and requirements (e.g., Conditions of CUP

Element	Goal	Policy	Applicability
	for natural disasters to impact the community.		Approval) and any future changes to the City of Signal Hill Municipal Code regarding seismic designs and controls
		Policy 1.k: Regulate development in Alquist-Priolo Earthquake Fault Zones consistent with levels of acceptable risk. Require the submission of geologic and seismic reports, as well as soils engineering reports, in relation to applications for land development permits whenever seismic or geologic problems are suspected.	CUP Sites #4 through 7 are located within an Alquist-Priolo fault zone. These sites are already developed drill sites and Project operations would be consistent with applicable regulations.

Source: City 2016

3.7.2.5 Paleontological Resources Preservation Act

The Paleontological Resources Preservation Act of 2002 codifies the generally accepted practice of limited vertebrate fossil collection and limited collection of other rare and scientifically significant fossils by qualified researchers. Researchers must obtain a permit from the appropriate state or federal agency and agree to donate any materials recovered to recognized public institutions, where they would remain accessible to the public and other researchers (NPS 2020).

3.7.3 Impact Assessment

The Initial Study for the Project determined that less than significant impacts would occur with regard to rupture of a known earthquake fault, soil erosion, subsidence, liquefaction and expansive soils, and that no impact would occur related to wastewater systems. Therefore, these issues are not addressed further in this EIR. Discussion of soil management is located in Section 3.8, Hazards and Hazardous Materials.

GEO (f). Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less than Significant with Mitigation Incorporated. Continued operations at the drill sites would not involve excavation activities; however, new Project activities, including drilling new wells and upgrades to the natural gas processing facility, would involve ground disturbance activities. Specifically, drilling of new wells could include the excavation and construction of new ancillary well cellars, and upgrades to the natural gas processing facility would include excavations for underground process piping, electrical conduits, and control cable conduits as well as reinforced concrete foundations for each piece of equipment.

The drill sites are situated within previously disturbed areas and no paleontological resources or unique geologic features were reported during previous development activities associated with the Project facilities. However, since the majority of Signal Hill, including the drill sites, are underlain by deposits that have the potential to include paleontological resources, there is potential to encounter paleontological resources during excavation activities which could result in a *potentially significant* impact.

MM GEO-1: All contractors and earth moving personnel shall be given Worker Environmental Awareness Program training by a qualified paleontological resource specialist prior to any ground-disturbing activities to discuss the activity's potential for impacting paleontological resources. The training shall inform personnel of the types of artifacts and features that may be encountered, the procedures to be followed if paleontological materials are unearthed at a Project site, contact information for appropriate reporting parties, and the regulatory requirements for the protection of paleontological resources. If an inadvertent discovery of paleontological materials is made during Project-related activities, ground disturbances in the area of the find will be halted, and a qualified professional paleontologist will be notified regarding the discovery. The paleontologist shall determine whether the resource is potentially unique and, if so, develop appropriate mitigation, such as avoidance or data recovery.

Residual Impacts

Incorporation of **MM GEO-1** would protect resources and develop treatment measures to effectively eliminate potentially significant impacts to previously undiscovered paleontological resources. Therefore, impacts would be reduced to a less than significant level.

3.8 Greenhouse Gas Emissions

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. GREENHOUSE GAS EMISSIONS. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.8.1 Environmental Setting

3.8.1.1 GHG Global Warming Potential

GHGs are a set of compounds whose presence in the atmosphere is associated with the differential absorption of incoming solar radiation and outgoing radiation from the surface of the earth. GHGs, such as carbon dioxide, methane, nitrous oxide, and certain synthetic chemicals, trap some of the Earth's outgoing energy, thus retaining heat in the atmosphere. This heat trapping causes changes in the radiative balance of the Earth - the balance between energy received from the sun and emitted from Earth - that alter climate and weather patterns at global and regional scales (Intergovernmental Panel on Climate Change [IPCC] 2021). More specifically, GHGs strongly absorb the long-wave radiation emitted by the earth and, hence, are capable of warming the atmosphere. Regulated GHGs in California are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF₃). Other GHGs, such as water vapor, are not regulated.

In order to attempt to quantify the impact of specific GHGs, each gas is assigned a global warming potential (GWP). Individual GHG compounds have varying GWPs and atmospheric lifetimes. The GWP of a GHG is a measure of how much a given mass of a GHG is estimated to contribute to global warming, relative to CO₂, which is assigned a GWP of 1.0.

The GWP is used to determine the carbon dioxide equivalent (CO₂e) mass of each GHG. The calculation of CO₂e is the accepted methodology for comparing GHG emissions since it normalizes various GHG emissions to a consistent reference gas, CO₂. For example, CH₄'s GWP of 25 indicates that the global warming effect of CH₄ is 25 times greater than that of CO₂ on a unit mass basis. CO₂e is the mass emissions of an individual GHG multiplied by its GWP. The physical properties and sources of GHGs are described in Table 3.8-1.

Table 3.8-1: Global Warming Potential, Properties, and Sources for Selected Greenhouse Gases

Pollutant	GWP	Description and Physical Properties	Sources
CO ₂	1	CO ₂ is an odorless, colorless, naturally occurring GHG.	CO ₂ is emitted from natural and anthropogenic (human) sources. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic out gassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.
CH ₄	25	CH ₄ is an organic, colorless, naturally occurring, flammable gas. Its atmospheric concentration is less than CO ₂ and its lifetime in the atmosphere is brief (10-12 years) compared to other GHGs.	CH ₄ has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of CH ₄ . Other anthropogenic sources include fossil-fuel and biomass combustion, as well as landfilling and wastewater treatment.
N ₂ O	298	N ₂ O, commonly referred to as “laughing gas,” is a colorless, nonflammable GHG. It is a powerful oxidizer and breaks down readily in the atmosphere.	Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used as an aerosol spray propellant, e.g., in whipped cream bottles. It is also used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars.
HFCs	92 - 14,900	HFCs are synthetic man-made chemicals that form one of the GHGs with the highest GWP	HFCs are man-made for applications such as automobile air conditioners and refrigerants.
PFCs	6,288 - 17,700	PFCs are colorless, non-flammable, dense gases that have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years.	The two main sources of PFCs are primary aluminum production and semiconductor manufacture.
SF ₆	22,800	SF ₆ is an inorganic, odorless, colorless, nontoxic, nonflammable gas.	SF ₆ is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in

Pollutant	GWP	Description and Physical Properties	Sources
			semiconductor manufacturing, and as a tracer gas for leak detection.
NF ₃	17,200	NF ₃ is an inorganic, colorless, odorless, nonflammable gas.	NF ₃ is used primarily in the plasma etching of silicon wafers

Source: CARB 2023c

There is growing concern about GHG emissions and their adverse impacts on the world’s climate and environment. These concerns relate to the change in the average climate of the earth that may be measured by changes in wind patterns, storms, precipitation, and temperature.

Throughout history, climate has been changing due to forces unrelated to human activity, including solar energy input variation, volcanic activity, and changing concentrations of key atmospheric constituents such as CH₄ and CO₂. These climate changes resulted in ice ages and warm interglacial periods, accompanied by large differences in snow and ice cover and associated changes in ecological systems.

Large-scale combustion of fossil fuels (i.e., coal, oil, and natural gas) by humans beginning in the 19th century resulted in significant increases in emissions of CO₂ and emission of other compounds with high GWP. Multiple lines of evidence confirm that human activities are the primary cause of global warming of the past 50 years. Natural factors, such as variations in the sun's output, volcanic activity, the Earth's orbit, the carbon cycle, and others, also affect Earth's radiative balance. However, beginning in the late 1700s, the net global effect of human activities has been a continual increase in GHG concentrations (IPCC 2021).

3.8.1.2 GHG Emissions Inventory

Emissions inventories identify and quantify the primary human-generated sources and sinks of GHGs. This section summarizes information on global, national, and state GHG emissions inventories. CARB is responsible for developing the California GHG Emission Inventory. The GHG inventory estimates the volume of GHGs emitted to and removed from the atmosphere by human activities within California and supports the AB 32 Climate Change Program. CARB’s current GHG emission inventory covers the years 2000 through 2022, and is based on fuel use, equipment activity, industrial processes, and other relevant data (e.g., housing, landfill activity, and agricultural land area). The Project emissions inventory is included in the development of the California GHG Emission Inventory.

- **Global Net Anthropogenic GHG Emissions.** Worldwide emissions of GHGs in 2019 totaled 59 billion ± 6.6 billion MTCO₂e (IPCC 2022). Global estimates are based on country inventories developed as part of the programs of the United Nations Framework Convention on Climate Change (UNFCCC).

- **United States Emissions.** In 2019, the United States emitted approximately 6.5 billion MTCO₂e. Of the six major sectors - electric power industry, transportation, industry, agriculture, commercial, and residential - the electric power industry and transportation sectors combined account for approximately 55 percent of the GHG emissions; the majority of the electric power industry and all of the transportation emissions are generated from direct fossil fuel combustion (UNFCCC 2023).
- **State of California Emissions.** According to CARB emission inventory estimates, California emitted approximately 369.2 million metric tons (MMT) of CO₂e emissions in 2020 (CARB 2022f). GHG emissions from the transportation and electricity sectors are approximately 36.8 percent and 16.1 percent of California’s emission inventory, respectively. The industrial sector contributes approximately 19.9 percent. The remaining sources of GHG emissions are high GWP gases at 5.8 percent, residential and commercial activities at 10.5 percent agriculture at 8.6 percent, and recycling and waste at 2.4 percent.

3.8.1.3 Global Climate Change

“Global climate change” refers to change in average meteorological conditions on the earth with respect to temperature, precipitation, and storms, lasting for decades or longer. The term “global climate change” is often used interchangeably with the term “global warming,” but “global climate change” is preferred by some scientists and policy makers to “global warming” because it helps convey the fact that in addition to rising temperatures, other changes in global climate may occur. Climate change may result from the following influences:

The likely range of total human-caused global surface temperature increase from 1850–1900 to 2010–2019 is 33.4°F to 34.3°F, with a best estimate of 33.9°F (IPCC 2021). GHGs were the main driver of tropospheric warming since 1979 and according to the IPCC, it is extremely likely that human-caused stratospheric ozone depletion was the main driver of cooling of the lower stratosphere between 1979 and the mid-1990s (IPCC 2021). Climate change modeling shows that further warming would occur, which could induce additional changes in the global climate system during the current century. Changes to the global climate system, ecosystems, and the environment of California could include higher sea levels, drier or wetter weather, changes in ocean salinity, changes in wind patterns or more energetic aspects of extreme weather (e.g., droughts, heavy precipitation, heat waves, extreme cold, and increased intensity of tropical cyclones). Specific effects from climate change in California may include a decline in the Sierra Nevada snowpack, erosion of California’s coastline, and seawater intrusion in coastal areas and in the Sacramento-San Joaquin River Delta. According to the 2006 California Climate Action Team Report, several climate change effects can be expected in California over the course of the next century (CalEPA 2006). These are based on trends established by the IPCC and downscaled for California and are summarized below.

- A diminishing Sierra snowpack declining by 70 to 90 percent, threatening the state’s water supply.

- A rise in sea levels, resulting in the displacement of coastal development. During the past century, sea levels along California’s coast have risen about seven inches. If emissions continue unabated and temperatures rise into the higher anticipated warming range, sea level is expected to rise an additional 22 to 35 inches by the end of the century. Sea level rises of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten levees and inland water systems, and disrupt wetlands and natural habitats. (Note: This condition would not affect the proposed Project area directly, as the Project area has an elevation of greater than 75 feet above mean sea level.)
- An increase in temperature and extreme weather events. Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in California. More heat waves can exacerbate chronic disease or heat-related illness.
- Increased risk of large wildfires if rain increases as temperatures rise. Wildfires in the grasslands and chaparral ecosystems of southern California are estimated to increase by approximately 30 percent toward the end of the 21st century because more winter rain will stimulate the growth of more plant fuel available to burn in the fall. In contrast, a hotter, drier climate could promote up to 90 percent more northern California fires by the end of the century by drying out and increasing the flammability of forest vegetation.
- Increasing temperatures from 8 to 10.4°F under the higher emission scenarios, leading to a 25 to 35 percent increase in the number of days that ozone pollution levels are exceeded in most urban areas.
- Increased vulnerability of forests due to forest fires, pest infestation, and increased temperatures.
- Reductions in the quality and quantity of certain agricultural products. The crops and products likely to be adversely affected include wine grapes, fruit, nuts, and milk.
- Exacerbation of air quality problems. If temperatures rise to the medium warming range, there could be 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today’s conditions. This is more than twice the increase expected if rising temperatures remain in the lower warming range. This increase in air quality problems could result in an increase in asthma and other health-related problems.
- A decrease in the health and productivity of California’s forests. Climate change can cause an increase in wildfires, an enhanced insect population, and establishment of non-native species.
- Increased electricity demand, particularly in the hot summer months.
- Increased ground-level ozone formation due to higher reaction rates of ozone precursors.

3.8.1.4 Existing Operations

The monthly totals of SHP's CUP Sites GHG emissions are quantified and recorded on an annual GHG worksheet which is uploaded into CARB's electronic GHG Reporting Tool (Cal e-GGRT) along with the rest of SHP's operations facility-wide. SHP uses continuous emissions monitoring systems (CEMS) on the turbine exhaust at Drill Site #2 to quantify and report CO₂ emissions. The turbine provides 75-80 percent of total operational energy, with the rest supplied by Southern California Edison. The CEMS utilizes an electronic data acquisition system to monitor record and report emission data. All measurements are done on a continuous real-time basis. The CEMS monitors stack NO_x emission concentrations, CO concentrations, ammonia slip, and stack gas volumetric flow rate. Emissions data are collected and recorded at one-minute intervals.

Per CARB's mandatory GHG reporting requirement, direct stationary source GHG emissions of CO₂, CH₄, and N₂O are required to be reported annually. SHP's historical GHG emissions are reported through CARB's Mandatory Reporting of Greenhouse Gas Emissions (MRR) program. These emissions represent all of SHP's operations within the Signal Hill/Long Beach area, and not just the seven CUP Sites applicable to the Project.

Ashworth Leininger Group verified all of SHP's facilities direct GHG emissions from production activities were 41,756 MTCO₂e in calendar year 2020. Ashworth Leininger Group conducted detailed data checks that focused on the largest and most uncertain estimates of emissions, product data, and fuel and electricity transactions. These GHG verifications are performed for and submitted to CARB as part of the mandatory GHG reporting requirement. Review of the CARB mandatory GHG reporting database indicates that the most recent year of data submitted by SHP is 2022, and in that year all of SHP's facilities (drill sites and other facilities) emitted 43,233 MTCO₂e (CARB 2024). Of the 43,233 MTCO₂e reported, approximately 78% is produced from the drill site, primarily through operations at the natural gas processing facility at Drill Site #2 (Ashworth Leininger Group 2023). Since mobile GHG emissions are not included in the GHG emissions reported to CARB through the MRR, these emissions have been quantified for baseline mobile sources and provided in Table 3.8-2 below. Analysis details for GHG emissions associated with operations can be found in Appendix D.

For a relative comparison of Project-related GHG emissions to other significant sources of GHGs in the region, the Port of Long Beach GHG emissions associated with cargo handling equipment alone were 133,039 MTCO₂e in 2022 (Port of Long Beach 2022), and the reported GHG emissions in 2022 for the University of California Los Angeles were 212,687 MTCO₂e (CARB 2022g). Similarly, City of LA Metro conducted an analysis of GHG emissions anticipated to result from proposed expansion of lane miles on freeways in the LA region (which began in 2017) and found that the work is expected to induce between 9.5 billion and 36.8 billion VMT and between 2.6 million and 10.1 million MTCO₂e GHG emissions between 2017 and 2047 (average

mobile GHG emissions of 337,033 MTCO₂e/year), as estimated using the UC Davis induced travel demand calculator (Metro 2022).

Table 3.8-2: SHP Baseline Mobile GHG Emissions (Metric Tons)

Source	CO ₂ (MT/Year)	CH ₄ (MT/Year)	N ₂ O (MT/Year)	CO ₂ e (MTCO ₂ e/year)
Employee Truck Trips (LDT2)	13.81	0.000	0.002	14.46
Heavy Duty Trucks (T7 Single)	43.35	0.000	0.001	3.5
Total	17.15	0.000	0.003	17.97

3.8.2 Regulatory Setting

3.8.2.1 [Executive Order S-3-05](#)

On June 1, 2005, Executive Order S-3-05 set the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels. It calls for the Secretary of CalEPA to be responsible for coordination of State agencies and progress reporting.

3.8.2.2 [Executive Order B-30-15](#)

In April 2015, Governor Edmund Brown issued an Executive Order establishing a statewide GHG reduction goal of 40 percent below 1990 levels by 2030. The emission reduction target acts as an interim goal between the AB 32 goal (i.e., achieve 1990 emission levels by 2020) and Governor Brown’s Executive Order S-03-05 goal of reducing statewide emissions 80 percent below 1990 levels by 2050. In addition, the Executive Order aligns California’s 2030 GHG reduction goal with the European Union’s reduction target (i.e., 40 percent below 1990 levels by 2030) that was adopted in October 2014.

3.8.2.3 [Assembly Bill 32 \(AB 32\)](#)

In September 2006, the California Global Warming Solutions Act of 2006, also known as AB 32, was signed into law. AB 32 focuses on reducing GHG emissions in California and requires CARB to adopt rules and regulations that would achieve GHG emissions equivalent to Statewide levels in 1990 by 2020. CARB initially determined that the total Statewide aggregated GHG 1990 emissions level and 2020 emissions limit was 427 MMT of CO₂e. The 2020 target reduction was estimated to be 174 MMT of CO₂e.

To achieve the goal, AB 32 mandates that CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce Statewide GHG emissions from stationary sources, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved.

3.8.2.4 [Senate Bill 32 \(SB 32\)](#)

SB 32 updated AB 32 to include an emissions reduction goal for the year 2030. Specifically, SB 32 requires the state board to ensure that statewide GHG emissions are reduced to 40 percent below the 1990 level by 2030. The new plan, outlined in SB 32, involves increasing renewable energy use, imposing tighter limits on the carbon content of gasoline and diesel fuel, putting more electric cars on the road, improving energy efficiency, and curbing emissions from key industries.

3.8.2.5 [Senate Bill 375 \(SB 375\)](#)

Acknowledging the relationship between land use planning and transportation sector GHG emissions, SB 375 was passed by the State Assembly on August 25, 2008, and signed by the Governor on September 30, 2008. This legislation links regional planning for housing and transportation with the GHG reduction goals outlined in AB 32. Reductions in GHG emissions would be achieved by, for example, locating employment opportunities close to transit.

Under SB 375, each Metropolitan Planning Organization would be required to adopt a Sustainable Community Strategy to encourage compact development that reduce passenger VMT and trips so that the region will meet a target, created by CARB, for reducing GHG emissions. If the Sustainable Community Strategy is unable to achieve the regional GHG emissions reduction targets, then the Metropolitan Planning Organization is required to prepare an alternative planning strategy that shows how the GHG emissions reduction target could be achieved through alternative development patterns, infrastructure, and/or transportation measures.

3.8.2.6 [Cap-and-Trade Program \(17 CCR 95800 to 96022\)](#)

On October 20, 2011, CARB approved the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation (Cap-and-Trade Program) as part of the AB 32 implementation measures. Cap-and-trade is a market-based regulation that is designed to reduce GHGs from multiple sources, including operators of Petroleum and Natural Gas Systems facilities (Section 95852(h)). It is viewed as an environmentally effective and economically efficient response to climate change. Cap-and-trade sets a firm limit, or cap on GHG emissions from all sources in the cap-and-trade program and minimizes the compliance costs of achieving AB 32 goals.

The initial cap was established in 2013 for the electrical sector and any large industrial source emitting more than 25,000 MTCO₂e per year. Oil and gas production activities are considered to be industrial activities and production facilities are included in the cap-and-trade program when their emissions exceed the 25,000 MTCO₂e threshold. Note that California's cap-and-trade program only applies to large industrial sources and electricity generators (covering a total of 450 entities) and does not capture the GHG emissions from other sources such as universities

or municipalities, regardless of the volume of GHGs emitted. Beginning in 2015, the cap was expanded to include GHG emissions from the combustion of transportation fuels and natural gas. The cap declines approximately 5 percent each year for the period 2021 through 2031, reducing the overall volume of GHGs that can be emitted by covered entities each year. In the market, a price on carbon is established for GHGs. Trading and market forces create incentives to reduce GHGs below allowable levels through investments in technological innovation in clean technologies. SHP is currently subject to the cap-and-trade program with annual GHG emissions exceeding the 25,000 MTCO₂e threshold requiring coverage, due primarily to operation of the power turbine at Drill Site #2.

3.8.2.7 Southern California Association of Governments

To implement SB 375 and reduce GHG emissions by correlating land use and transportation planning, SCAG adopted the 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy on September 3, 2020. The 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy reaffirms the land use policies that were incorporated into the 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy. The 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy describes how the region can attain the GHG emission-reduction targets set by CARB by achieving a 19 percent reduction by 2035 compared to the 2005 level on a per capita basis. Compliance with and implementation of 2020 Regional Transportation Plan/Sustainable Communities Strategy policies and strategies would have co-benefits of reducing per capita criteria air pollutant emissions associated with reduced per capita VMT.

3.8.2.8 Climate Change Scoping Plan

In 2008, CARB approved the original *Climate Change Scoping Plan* as required by AB 32. Subsequently, CARB approved updates to the *Climate Change Scoping Plan* in 2014 (First Update) and 2017 (2017 Update), with the *2017 Update* considering SB 32 (adopted in 2016) in addition to AB 32. The original *Climate Change Scoping Plan* proposed a “comprehensive set of actions designed to reduce overall carbon GHG emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health. The original *Climate Change Scoping Plan* identified a range of GHG reduction actions that included direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms, such as a cap-and-trade system, and an AB 32 implementation fee to fund the program.

The original *Climate Change Scoping Plan* called for a “coordinated set of solutions” to address all major categories of GHG emissions. Transportation emissions were addressed through a combination of higher standards for vehicle fuel economy, implementation of the Low Carbon Fuel Standard (LCFS), and greater consideration to reducing trip length and generation through

land use planning and transit-oriented development. Buildings, land use, and industrial operations were encouraged and, sometimes, required to use energy more efficiently. Utility energy providers were required to include more renewable energy sources through implementation of the Renewables Portfolio Standard. Additionally, the original Climate Change Scoping Plan emphasized opportunities for households and businesses to save energy and money through increasing energy efficiency. It indicated that substantial savings of electricity and natural gas would be accomplished through “improving energy efficiency by 25 percent.”

On November 16, 2022, CARB adopted California’s *2022 Scoping Plan for Achieving Carbon Neutrality* (CARB 2022d). The *2022 Scoping Plan* builds upon the framework established by the original *Climate Change Scoping Plan* and the First Update while identifying new, technologically feasible, and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health. The *2022 Scoping Plan Update* includes policies to require direct GHG emissions reductions at some of the state’s largest stationary sources and mobile sources. These policies include the use of lower GHG fuels, efficiency regulations, and the cap-and-trade program, which constrains and reduces emissions at covered sources by placing an overall cap on the total amount of cumulative GHG emissions from all covered sources each year. Accordingly, the volume of GHGs emitted by each of the covered entities will vary year to year based on the number of credits that they purchase, and each year the total number of credits that are available for purchase declines, reducing the total number of GHGs emitted cumulatively from all covered entities.

3.8.2.9 California Green Building Standards (CALGreen Code)

The California Green Building Standards Code (CCR Title 24, Part 11), commonly referred to as the CALGreen Code, went into effect on January 1, 2017. CALGreen standards require new residential and commercial buildings to comply with mandatory measures under five topical areas: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics. The 2019 CALGreen code updates were published July 1, 2019, with an effective date of January 1, 2020.

The California Energy Code (CCR Title 24, Section 6) was created as part of the California Building Standards Code (CCR Title 24) by the California Building Standards Commission in 1978 to establish statewide building energy efficiency standards to reduce California’s energy consumption. These standards include provisions applicable to all buildings, residential and nonresidential, which describe requirements for documentation and certificates that the building meets the standards. Compliance with Title 24 is enforced through the building permit process.

3.8.2.10 Greenhouse Gas Reporting Program

The USEPA's GHG Reporting Program, codified at 40 CFR Part 98, requires GHG data reporting from large GHG emission sources, fuel and industrial gas suppliers, and carbon dioxide injection sites in the United States. In general, the GHG Reporting Program applies to covered facilities (i.e., large industrial facilities and electricity generation) that emit 25,000 MTCO₂e or more per year in the United States and requires such facilities to submit GHG emission reports on an annual basis. USEPA electronically verifies data submitted and publishes the data.

Because all of the SHP's operations cumulatively emit more than 25,000 MTCO₂e annually, it is classified as a large industrial facility. Therefore, SHP is subject to the GHG Reporting Program and has a history of compliance with the program. SHP would continue to be subject to applicable provisions of USEPA's GHG Reporting Program throughout the proposed 20-year extended term of the Project.

3.8.2.11 CEQA Guidelines Amendments

SB 97 required the Governor's Office of Planning and Research to develop CEQA Guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions." The CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. Noteworthy revisions to the CEQA Guidelines include the following:

- Lead agencies should quantify all relevant GHG emissions and consider the full range of project features that may increase or decrease GHG emissions as compared to the existing setting;
- A lead agency may appropriately look to thresholds developed by other public agencies;
- To qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project. General compliance with a plan, by itself, is not mitigation;
- The effects of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis; and
- Given that impacts resulting from GHG emissions are cumulative, significant advantages may result from analyzing such impacts on a programmatic level. If analyzed properly, later projects may tier, incorporate by reference, or otherwise rely on the programmatic analysis.

3.8.2.12 SCAQMD Interim CEQA GHG Thresholds

SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds in October 2008. Accordingly, the SCAQMD Interim GHG Significance Threshold takes a tiered approach whereby Projects can be screened out by one of the following five methods: exemption from CEQA, GHG emissions already analyzed in GHG budgets from approved regional plans, having emissions less than the 10,000 MTCO₂e/year screening level (for

industrial projects), meeting best performance standards, or purchase GHG emissions offsets by funding projects or buying them outright. Per the guidance, Projects with incremental increases less than this threshold can be screened out of further analysis and are not cumulatively considerable.

3.8.3 Impact Assessment

GHG (a). Would the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than Significant. As discussed in Section 3.8.3.9, SHP is subject to USEPA’s GHGRP and California’s MRR for GHG reporting. As a result, SHP has submitted its GHG emissions data to both USEPA and CARB in the required reporting years, including the most recently reported year of 2022, and maintains a plan for accurately capturing and recording this data. As required by CARB, SHP has and will continue to have its GHG emissions data reports verified each year by a CARB-accredited verification body. In 2020, SHP emitted a verified 41,756 MTCO₂e from its oil and gas production activities, which includes the usage of natural gas and other fuels from stationary source operations. Additionally, since mobile (e.g., trucks or passenger vehicles) GHG emissions are not included in the GHG emissions reported to CARB through the MRR, these emissions have been quantified for baseline mobile sources and presented in Table 3.8-2. These GHG emissions would continue with continued operations of existing facilities as part of the proposed Project.

Additional Project-related GHG emissions sources include construction of new well cellars and the proposed gas system modifications/LTS unit at CUP Site #2 modification, as well as electricity consumed by Drill Rig #6 and operation of new pumpjacks, as well as diesel combustion if Drill Rig #5 is utilized. Table 3.8-3 presents construction GHG emissions and indirect emissions for the annual electricity anticipated for drilling and re-drilling using Rig #6, as well as new pumpjacks associated within new wells operating throughout the life of the Project. GHGs from fuel used from Drill Rig#5 generator was also estimated. During the City’s review of the Project, SHP confirmed the diesel Drill Rig #5 is only utilized 10% of the time during drilling/re-drilling, while GHG emissions due to increased electricity consumed by Drill Rig #6 (would continue to be utilized for 90% of future drilling/re-drilling operations) was included in the calculated Project GHG emissions.

Potential GHG emissions from additional Project operations from well heads are associated with potential system leaks. As discussed above, SHP has a leak detection system in place. Any detected leaks are repaired within 24 hours per SHP protocols and CalGEM requirements. Although fugitive GHG emissions from the leaks are expected to be minimal, the GHG emissions for operation of the well heads were calculated based on CARB’s MRR §95153(o) and default emission factors from Appendix C of the MRR. In addition, fugitive GHG emissions from additional well heads were calculated using the following assumptions: 1) one week duration

per leak, although SHP procedures includes repairing leaks within 24 hours, and 2) 100 percent of fugitive emissions are assumed to be CH₄, which has a higher global warming potential (GWP) than CO₂, although facilities are required to use a gas sample for GHG reporting. Total Project operation GHG emissions associated with additional Project components are presented in Table 3.8-3. Appendix D includes additional detail on emission sources and assumptions.

Table 3.8-3: Project-Related GHG Emission¹

Source	CO ₂ (MT/Year)	CH ₄ (MT/Year)	N ₂ O (MT/Year)	CO ₂ e (MTCO ₂ e/year)
Construction Emissions				
LTS Construction Equipment	16.08	4.70E-03	0.000	16.20
LTS On-Road Equipment	6.68	2.57E-06	0.001	6.99
Well Cellar Construction Equipment	0.48	1.55E-04	0.000	0.48
Well Cellar On-Road Equipment	0.07	5.95E-08	0.000	0.07
Total Construction Emissions	23.31	0.005	0.0011	23.75
Operations Emission				
Annual Electricity Usage ₂	1,016	0.10	0.012	1,022
Redrilling	81.19	0.03	--	
New Drilling	67.66	0.0219	--	68.20
New Well Head Fugitives ₃	0.00	0.0902	--	2.26
Total Operations Emissions	1,165	0.23	0.012	1,174
Total Project GHG Emissions				1,197.6

Notes:

¹ GHG emissions were estimated for the proposed Project for the operations year with the highest level of GHG emissions to be reasonably conservative. Specifically, annual GHG emissions shown above assumed full Project build-out (i.e., 46 new well heads, pumpjacks, etc.). Given new wells will be added incrementally and there is the potential to abandon existing wells during the CUP period, the emissions above represent a higher than anticipated level of the Project's maximum annual GHG emissions.

² Emission factors are year 2022 for SCE published in CalEEMod version 2022.1 User Guide Appendix G, Default Data Tables.

³ Subject to CARB MRR and Cap and Trade requirements.

The new GHG emissions sources summarized in Table 3.8-3 includes the GHG emissions from mobile sources and indirect electricity (non-Cap-and-Trade emissions) for the additional Project components (i.e., well drilling and redrilling and operation of new well pumpjacks and LTS system). As shown in Table 3.8-3, the construction and operation of additional Project components will increase SHP's annual GHG emissions by approximately 1,197.6 MTCO₂e/year in addition to the 41,756 MTCO₂e associated with continued operations of the existing facilities. Note that most of this increase (i.e., 1,022 MTCO₂e/year) is due to indirect GHG emissions resulting from additional electricity consumed within the new LTS system and pumpjacks for new wells, all of which would be accounted for under the Cap-and-Trade program.

For the last two decades, as part of its efforts to reduce local air pollution, SCAQMD has promoted several programs to combat climate change. For instance, SCAQMD has promoted energy conservation, low-carbon fuel technologies (natural gas vehicles; electric-hybrids, hydraulic-hybrids, and battery-electric vehicles), renewable energy, VMT reduction programs, and market incentive programs. SCAQMD adopted the Air Quality-Related Energy Policy, which integrates air quality, energy, and climate change issues in a coordinated and consolidated manner. The goals of this policy include the following elements:

- Promote zero and near-zero emission technologies through ultra clean energy strategies, to meet air quality, energy security, and climate change objectives.
- Promote zero and near-zero emission technologies in both stationary and mobile applications to the extent feasible.
- Promote diversification of electricity generation technologies to provide reliable, feasible, affordable, sustainable, and zero or near-zero emission electricity supply for the Basin in partnership with local power producers.
- Promote demand side management programs to manage energy demand growth. Such programs include, but are not limited to, energy conservation, energy efficiency and load-shifting measures.
- Promote in-Basin distributed electricity generation, with emphasis on distributed renewable electricity generation, to reduce reliance on energy imports or central power plants, and to minimize the air quality, climate and cross-media environmental impacts of traditional power generation.
- Incorporate energy efficiency and conservation as an emissions reduction strategy for stationary and mobile sources through SCAQMD’s planning, rule-making, advocacy, and CEQA commenting activities
- Promote electricity storage technology to improve supply reliability, availability, and increased generation technology choices.

Additional reductions would be achieved through the regulatory process of the air district and CARB as required, such as changes to diesel engines are implemented which would affect the product delivery trucks and limits on idling. The strategies currently being implemented by CARB may help in reducing the Project’s GHG emissions and are summarized in Table 3.8-4 below.

Table 3.8-4: Select CARB GHG Emission Reduction Strategies

Strategy	Description of Strategy
Vehicle Climate Change Standards	AB 1493 (Pavley) required the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light duty trucks. Regulations were adopted by CARB in September 2004.
Diesel Anti-Idling	In July 2004, CARB adopted a measure to limit diesel-fueled retail motor vehicle idling.
Other Light-Duty Vehicle Technology	New standards would be adopted to phase in beginning in the 2017 model year.
Alternative Fuels: Biodiesel Blends	CARB would develop regulations to require the use of 1% to 4% Biodiesel displacement of California diesel fuel.
Alternative Fuels: Ethanol	Increased use of ethanol fuel.
Heavy-Duty Vehicle Emission Reduction Measures	Increased efficiency in the design of heavy-duty vehicles and an educational program for the heavy-duty vehicle sector.

The analysis of GHG emissions is a different analysis than for criteria pollutants for the following reasons. For criteria pollutants, several CAAQS and NAAQS are based on relatively short-term exposure effects to human health (one-hour and eight-hour standards), whereas the half-life of CO₂ is approximately 100 years, and as such the effects of GHGs occur over a longer timeframe than a single day. GHG emissions are typically considered to be cumulative impacts because they contribute to global climate change (versus local impacts). However, each project resulting in an emissions increase would contribute to the cumulative impact that emissions occurring planet-wide have on global climate change. Thus, determination of whether the Project contribution is cumulatively considerable is required to evaluate this impact.

There are many requirements for sources to reduce GHG emissions and most originate from the AB 32 Scoping Plan and associated programs administered by CARB. The Scoping Plan is the State’s blueprint for how GHG reductions will be achieved. Local jurisdictions may have requirements as well, but the overall effort is centralized with CARB. Therefore, this impact evaluates whether the Project may conflict with the Scoping Plan (see Section 3.8.3.7). In addition, the SCAQMD Interim GHG Significance Threshold takes a tiered approach whereby Projects can be screened out by one of the following five methods: exemption from CEQA, GHG emissions already analyzed in GHG budgets in approved regional plans, having emissions less than the 10,000 MTCO₂e/year screening level, meeting best performance standards, or purchase GHG emissions offsets by funding projects or buying them outright. Per the interim guidance, Projects with incremental GHG emissions increases less than this threshold can be screened out of further analysis and are not cumulatively considerable. However, in the decade after SCAQMD adopted the Interim GHG Significance Threshold, several new laws and executive orders were adopted that require additional reductions in years after 2020. For instance, SB 32 requires that GHG emissions be 40 percent less than 1990 levels by 2030. More

drastic still, SB 100 which was signed by the Governor recently requires 100 percent zero-carbon electricity by 2045. On the day SB 100 was signed into law, the Governor also signed Executive Order B-55-18 which commits California to total, economy-wide carbon neutrality by 2045. As such, the SCAQMD's 2008 interim guidance may be somewhat inadequate in producing a meaningful comparison by today's standards.

The impact analysis for the Project follows the approach certified by SCAQMD in the Final Negative Declaration for the Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project on December 12, 2014 (SCAQMD 2014). The approach used by SCAQMD to assess GHG impacts from that project recognizes that consumers of electricity and transportation fuels are, in effect, regulated by requiring providers and importers of electricity and fuel to participate in the GHG Cap-and-Trade Program and other Programs (e.g., low carbon fuel standard, renewable portfolio standard, etc.). Each such sector-wide program exists within the framework of AB 32 and its descendant laws, the purpose of which is to achieve GHG emissions reductions consistent with the AB 32 Scoping Plan.

In summary, the Project would increase GHGs emissions from operations, electricity use, and combustion of gasoline/diesel fuels, each of which is regulated near the top of the supply-chain. As discussed above, crude oil production and refining are included in the AB 32 Cap-and-Trade Program, which requires purchase of California Carbon Allowances to offset GHG emissions associated with operations. SHP is currently obligated to comply with the AB 32 Cap-and-Trade Program, which requires SHP to offset covered GHG emissions by providing California Climate Allowances. With respect to GHGs from electricity, the Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. The Project would meet its fair share of the cost to mitigate the cumulative impact of global climate change associated with electricity use because SHP is purchasing energy from the California market. With respect to GHGs from use and combustion of gasoline/diesel fuels, the Cap-and-Trade Program also covers the GHG emissions associated with the combustion of transportation fuels in California, whether refined in-state or imported. The point of regulation for transportation fuels is when they are “supplied” (i.e., delivered into commerce).

Accordingly, virtually all GHG emissions from CEQA projects associated with VMT are covered under the Cap-and-Trade Program since fuel suppliers are required to purchase allowances to cover the carbon pollution produced when the fuel they supply is burned. Thus, Project GHG emissions will be consistent with the relevant plan (i.e., AB 32 Scoping Plan). Therefore, the Project's GHG emissions from operations, electricity use, and combustion of gasoline/fuels are covered under the Cap-and-Trade Program and would not conflict with California's 2030 GHG reduction target of at least 40 percent below 1990 levels. As such, the Project's contribution to cumulative global climate change impacts would not be cumulatively considerable and impacts are considered less than significant.

GHG (b). Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less than Significant. As discussed for Impact Criteria GHG (a) above, SHP is subject to USEPA's GHGRP and California's Mandatory Reporting of Greenhouse Gas Emissions. As a result, SHP has submitted its GHG emissions data to both USEPA and CARB in the required reporting years and maintains a plan for accurately capturing and recording this data. In 2020, SHP emitted a verified 44,756 MTCO_{2e} from its oil and gas production activities, which includes the usage of natural gas and other fuels from stationary source operations. Further, the SHP facilities are subject to the applicable Cap-and-Trade Program requirements to offset any significant impacts with regard to GHG, as required, and existing operations of SHP facilities have been considered in GHG inventories.

The Project would result in minor improvements to the gas processing facility at Drill Site #2 that would improve the efficiency and reliability of existing onsite operations and enable the sale of gas to third parties for ultimate distribution. Further, due to the nature of the project and construction/operational conditions anticipated, the project is not anticipated to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases (as detailed above for Impact Criteria GHG (a)). As described previously, the proposed Project would reduce fugitive emissions associated with natural gas transmission and reduce or avoid potential additional GHG-related emissions from independent gas producers. Although the Project would generate GHGs from electricity use and combustion of gasoline/diesel fuels, these sources are regulated near the top of the supply-chain. As such, each citizen of California (including the operator of the Project) will have no choice but to purchase electricity and fuels produced in a way that is acceptable to the California market. Thus, Project GHG emissions will be consistent with the relevant plan (i.e., AB 32 Scoping Plan). The Project would meet its fair share of the cost to mitigate the cumulative impact of global climate change because SHP is purchasing energy from the California market. Thus, the Project would not conflict with any applicable plans, policy, or regulation with the purpose of reducing emissions of GHG and impacts would be less than significant.

3.9 Hazards and Hazardous Materials

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.9.1 Environmental Setting

3.9.1.1 Hazardous Materials

A hazardous material is defined as 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 if released into the workplace or the environment (HSC Section 25501(o)). The term “hazardous materials” refers to both hazardous substances and hazardous wastes. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic, ignitable, corrosive, or reactive.

CalEPA Department of Toxic Substances Control (DTSC) maintains EnviroStor, a data management system for tracking cleanup, permitting, enforcement and investigation efforts at hazardous waste facilities and sites with known contamination or sites where there may be reasons to investigate further. EnviroStor lists 102 permitted hazardous waste facilities under the CalEPA DTSC in California, and 690 corrective action sites. Per the current EnviroStor database (DTSC 2023), none of the CUP Sites are listed as cleanup sites.

The SWRCB maintains GeoTracker, a database of environmental data from water quality regulatory programs, including oil and gas monitoring related activities. Per the current GeoTracker database (SWRCB 2023a), CUP Site #2 was listed as a leaking underground storage tank cleanup site; however, the case was closed in 1999 (SWRCB 2023b). The SWRCB also maintains a list of solid waste disposal sites with waste constituents above hazardous waste

levels outside the waste management unit (SWRCB 2023c). None of the CUP Sites are currently found on this list. The SWRCB also maintains a list of active Cease and Desist Orders and Cleanup and Abatement Orders (SWRCB 2023d), and none of the drill sites are currently found on this list.

SHP currently stores hazardous materials at all drill sites except for CUP Site #6. Visual inspections of the hazardous materials and hazardous waste storage areas at the drill sites are documented weekly (SHP 2022g). Hazardous materials are currently stored on storage pads with secondary containment, within larger contained (bermed and/or walled) areas such as inside aboveground tank batteries, within portable or permanent individual secondary containment cradles, or within maintenance/supply sheds or curbed areas. Table 2.4-3 lists the hazardous materials currently stored at the various drill sites.

The central permanent hazardous materials storage area which serves all the CUP operations is located at CUP Site #7. Generally, hazardous materials are transported from CUP Site #7 on an as needed basis to the other drill sites, which typically store only hazardous materials in use at the site. SHP is permitted to transport hazardous materials on motor vehicles by the California Highway Patrol.

3.9.1.2 Hazardous Waste

Hazardous wastes are hazardous substances that no longer have a practical use, such as materials that have been spent, discarded, discharged, spilled, contaminated, or are being stored until they can be disposed of properly (22 CCR Section 66261.3).

During the period 2016-2021 CUP Sites #2 and #5 were the only sites that generated hazardous waste under CalEPA IDs CAL000329007 and CAL000329008 respectively. Both sites are small quantity generators. Hazardous waste containers are stored on storage pads with secondary containment, within larger contained (bermed and/or walled) areas such as inside aboveground tank batteries, within portable or permanent individual secondary containment cradles, or within maintenance/supply sheds or curbed areas. An average of approximately 2.1 tons per year of hazardous waste is generated at each of the two sites (Sespe Consulting, Inc. 2022d).

CUP Sites #2 and #5 typically generate only non-Resource Conservation and Recovery Act (RCRA) hazardous waste with the exception of 2010 and 2009 respectively. CUP Site #2 generated 150 gallons of RCRA waste flammable liquids (petroleum distillates) and 10 gallons of waste corrosive liquids in 2010 (Sespe Consulting, Inc. 2022d). CUP Site #5 also generated 300 pounds of waste aerosols in 2009 (Sespe Consulting, Inc. 2022d). The non-RCRA waste is primarily oily rags and oil filters from site maintenance activities. In 2021, a combined total of approximately 1.45 tons of Non-RCRA Hazardous Solid Waste (e.g., oily rags, oil filters, absorbent debris, oil) was generated at CUP Sites #2 and #5 (Sespe Consulting, Inc. 2022d).

3.9.1.3 Spill Prevention and Containment

SHP currently implements various spill prevention and response procedures to minimize potential releases from the drill sites. Specifically, hazardous materials and hazardous wastes are stored on storage pads with secondary containment, within larger contained (bermed and/or walled) areas such as inside aboveground tank batteries, within portable or permanent individual secondary containment cradles, or within maintenance/supply sheds or curbed areas. As discussed above, hazardous materials and hazardous waste storage are visually inspected weekly to ensure containers are in good condition and that there is no evidence of a leak or spill. Tanks storing hazardous materials have devices to prevent spills and have tank enclosures which are designed to a specific height to provide adequate containment volume for the largest tank volume assuming a complete failure of the tank during a worst-case precipitation event. Contained areas do not have automatic valves which would allow releases to exit the contained areas. Additionally, all drill sites except for Drill Site #5 are generally contained by existing block walls, other than small gaps where existing access gates are located. Drill Site #5 also has secondary containment walls around all existing tanks, sumps, and weir systems to prevent stormwater or other runoff. Well cellars are checked periodically for accumulation of oil resulting from maintenance or drilling and are removed by vacuum truck or pump. SHP performs routine visual inspections of all containment walls and berms, inside and outside of the enclosures, and the foundations to ensure that there are no cracks, holes, or significant erosion that may lead to releases of contained spills. Maintenance personnel visually inspect all equipment and remove any debris that may accumulate to block passage of process fluids or storm water (Sespe Consulting, Inc. 2022d) As discussed in the Impact Analysis and shown in Table 3.9-4 below, the only release that has occurred as any of the drill sites is a wellhead rupture at Drill Site #2 which resulted in a release of produced water and was contained on-site.

In addition, SHP maintains three separate Spill Prevention Containment and Countermeasures (SPCC) and spill contingency plans (i.e., Central, West, and East units) that cover the seven drill sites. These plans would continue to be updated as needed throughout the proposed 20-year life of the Project. SHP also maintains five separate HMBPs for Drill Sites #1 through #5. Bulk storage of hazardous materials/production chemicals was recently relocated to CUP Site #7 and a supplemental HMBP was completed and approved on October 20, 2022. Drill Site #6 does not store hazardous materials, and therefore is not subject to the HMBP requirements. HMBPs are updated annually and submitted to the Los Angeles County Fire Department for review and approval, and these plans would continue to be updated as needed throughout the proposed 20-year life of the Project. In addition to site-specific safety and spill containment plans and procedures, SHP also maintains a supplemental Emergency Action Plan and Process Safety Manual (which includes an Injury and Illness Prevention Plan).

Further, CalGEM requires that pipeline operators prepare a Pipeline Management Plan (PMP), which must be updated within 90 days whenever pipelines are acquired, installed, altered, or at

the request of the CalGEM State Supervisor of Oil and Gas. SHP's existing PMP includes information on their maintenance program, including regular patrols and visual inspections, damage prevention, pipeline markers, corrosion monitoring and remediation, pipeline alarm sensors, and integrity inspections and testing. Under CUP 97-03, SHP currently has and implements a CalGEM PMP, a U.S. Department of Transportation's Facility Response Plan, and a CHP hazardous materials transportation license. For all drill sites, SHP has ensured by contract the availability of Patriot Environmental Services to respond to a release or the threat of a release of hazardous materials. SHP also has additional available cleanup/disposal contractors to help if needed in the event of a release or the threat of a release of hazardous materials. SHP also has preexisting arrangements with emergency service providers at all drill sites as applicable.

3.9.1.4 Fire Hazards

Potential fire hazards are associated with all oilfield operations due to the potential for explosion or fire resulting from the ignition of accumulated methane gas and overheating of pumps due to mechanical failures can cause oil well fires. However, as stated in the Safety Element, existing active wells in Signal Hill pose only minor fire hazards. The liquid extracted from wells is a mixture of salt water and oil which is substantially less combustible than pure oil. In addition, required blowout prevention equipment significantly reduces potential hazards from oil well fires (City 2016). Drill Site #2 currently stores approximately 190,000 pounds of flammable mixture under the covered process, gas processing, which exceeds the threshold quantity of 10,000 pounds under CalARP, California Occupational Safety and Health Administration Process Safety Management, and USEPA Risk Management Plan for flammable gases and liquids. SHP is subject to CalARP and EPA Risk Management Plan Program Level 3, which is based on the facility's North American Industry Classification System (NAICS) code and applicability to OSHA Process Safety Management and has additional requirements as compared to Program Levels 1 and 2. To comply with the three programs, SHP has a CalARP and EPA Risk Management Plan Program 3 Compliance Workbook, which outlines process safety information, process hazard analysis, operating procedures, training, mechanical integrity, management of change, pre-startup safety review, compliance audits, incident investigation, employee participation, hot work permit, contractors, and emergency planning and response. Drill Site #2 has a Los Angeles County Annual Unified Program Facility Permit for the CalARP Program (Los Angeles County Fire Department 2021). The risk of fire and explosion at Drill Site #2 was also analyzed in the CalARP and USEPA Risk Management Plan Program 3 Compliance Workbook. The hazard analysis in the workbook analyzed various fire and explosion scenarios as the worst case, which is based on very conservative assumptions, and alternative release scenarios. As described in the workbook, all equipment at the site was built and modified in accordance with National Fire Protection Association standards. The workbook also identifies safety systems such as relief valves, emergency shutdown, and indicators which minimize safety risks such as fire and explosion. The facility has operating procedures, preventative

maintenance, and training to ensure proper functioning and operation of all equipment and safety systems. SHP's emergency action plan approved by Los Angeles County Fire Department identifies measures to be used to minimize impacts to public safety and employees in the event of a fire or explosion.

3.9.2 Regulatory Setting

3.9.2.1 [U.S. Department of Transportation Oil Pollution Act of 1990 \(49 CFR Part 194\)](#)

The U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration implements the Oil Pollution Act of 1990 to decrease the likelihood of onshore oil pipeline spills, reduce environmental consequences of spills, and ensure well-planned and fast responses to spills. Facility response plans are a requirement for operators of any onshore oil pipelines which could cause significant harm to the environment by discharging oil into waters of the United States (DOT 2018). The purpose of a facility response plan is to address, prepare, and plan for responding to a worst-case discharge. It also establishes the communication, containment, and clean-up procedures in the event of a worst-case discharge. SHP complies with this requirement by preparing facility response plans for their various facilities.

3.9.2.2 [U.S. Department of Transportation Hazardous Materials Registration \(49 CFR Part 107\)](#)

Operators and transporters of certain hazardous materials are required to file an annual registration statement with the U.S. Department of Transportation. This program funds grants which are provided to various states and Indian tribes for emergency response planning and training. This program began in 1992 and is administered by Pipeline and Hazardous Materials Safety Administration (DOT 2022). SHP must comply with this requirement and is required to file registrations statements annually with the U.S. Department of Transportation.

3.9.2.3 [U.S. Environmental Protection Agency, Spill Prevention Control and Countermeasure Plan \(40 CFR 112\)](#)

The SPCC rule is implemented by the USEPA. The purpose is to help facilities prevent a discharge of oil into navigable waters or adjoining shorelines, and requires facilities to develop, maintain, and implement an SPCC plan. The goal of an SPCC plan is to prevent an oil spill and control any spill that occurs. Facilities subject to 40 CFR 112 include those with underground oil tank capacities exceeding 42,000 gallons or aboveground oil tanks exceeding a total capacity of 1,320 gallons (USEPA 2022c). SHP facilities which exceed these amounts are required to have an SPCC. SHP maintains three separate SPCC plans (i.e., Central, West, and East units) that cover their seven CUP 97-03 sites. These plans would continue to be updated as needed throughout the proposed 20-year life of the Project.

3.9.2.4 California Accidental Release Protection (CalARP)

The CalARP Program enforces the requirements of the federal Risk Management Plan requirements and certain requirements from the California Health and Safety Code. Risk Management Plans (RMPs) consist of three main elements: a hazard assessment that includes offsite consequences analyses and a five-year accident history, a prevention program, and an emergency response program.

3.9.2.5 Process Safety Management of Highly Hazardous Chemicals

Process Safety Management of Highly Hazardous Chemicals specifies required prevention program elements to protect workers at facilities that handle toxic, flammable, reactive, or explosive materials. Prevention program elements are aimed at preventing or minimizing the consequences of catastrophic releases of the chemicals and include process hazard analyses, formal training programs for employees and contractors, investigation of equipment mechanical integrity, and a contingency plan.

3.9.2.6 Hazardous Materials Release Response Plans and Inventory Program

Health and Safety Code Sections 25500 - 25547.8, Hazardous Materials Release Response Plans and Inventory Program requires local agencies to regulate the storage and handling of hazardous materials and requires development of a HMBP to mitigate the release of hazardous materials. Businesses that handle a hazardous material or a mixture containing a hazardous material that has a quantity that is greater than or equal to 55 gallons for materials that are liquids, 500 pounds for solids, or 200 cubic feet for compressed gas must submit to Certified Unified Program Agencies (CUPAs) (e.g., fire departments) an inventory of the hazardous materials, an emergency response contingency plan, and an employee training program. The HMBP must provide a description of the types of hazardous materials/waste onsite and the location of these materials. The information in the business plan can then be used in the event of an emergency to determine the appropriate response action, the need for public notification, and the need for evacuation.

The Enforcement and Emergency Response Division (EERD) has delegated several environmental programs, including the Hazardous Materials Release Response Plans and Inventory Program, to be administered by the CUPA agency, overseen by DTSC. CUPA consolidates all of the requirements of these various programs into one set of regulations to reduce the regulatory burden and improve the consistency of information between regulatory agencies.

3.9.2.7 Hazardous Waste Management System: General

DTSC implements EPA's definitions of small quantity and large quantity generators under CCR Title 22, Division 4.5, Chapter 10, Article 2. A "small quantity generator" (SQG) is defined as a generator who generates less than 1,000 kilogram of hazardous waste in a calendar month.

3.9.2.8 4.2.2.5 Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities

DTSC implements Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities under CCR, Title 22, Division 4.5, Chapter 14. These regulations include accident prevention requirements (Article 3), inspection and containment requirements for tanks and containers (Articles 9 and 10), and performance standards for miscellaneous units (Article 16). Article 3 outlines requirements regarding facility design and operation, equipment, testing and maintenance, access to communications or alarm systems, aisle space, and arrangements with local authorities. Article 9 outlines requirements regarding use and management of containers, compatibility of waste with containers, inspections, and containment. Article 10 outlines requirements regarding assessment of tank integrity, design and installation of new tank systems or components, containment and detection of releases, general operating requirements, inspection, response to leaks or spills, and closure and post-closure care. Article 16 outlines environmental performance standards; monitoring, analysis, inspection, response, reporting, and corrective actions; and post-closure care for miscellaneous units.

3.9.2.9 Uniform Fire Code--Hazardous Materials Management Plan, Hazardous Materials Inventory Statement

The Uniform Fire Code (UFC) prescribes regulations that are consistent with best practices to address fire and explosion hazards with storage of hazardous materials, handling and use of hazardous substances, materials and devices. The State Fire Marshal has adopted the UFC, with amendments, as the California Fire Code. Local fire departments are required to have local fire codes that are no less stringent than the state fire code.

3.9.2.10 Hazardous Waste Control Act of 1972 (HSC Division 20, Chapter 6.5)

The Hazardous Waste Control Act established the state hazardous waste management program, which is similar to, but more stringent than RCRA. The Hazardous Waste Control Law regulates the management of hazardous waste under HSC Division 20 Chapter 6.5. This law defines hazardous wastes and best handling practices, transportation, and disposal of hazardous waste.

3.9.2.11 Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)

Senate Bill 1082 of 1993 (HSC Chapter 6.11) required the Secretary of the CalEPA to establish a “unified hazardous waste and hazardous materials management” regulatory program (Unified Program) by January 1, 1996. Currently, there are 83 Certified Unified Program Agencies (CUPA) in California.

3.9.2.12 Aboveground Petroleum Storage Act

The Aboveground Petroleum Storage Act requires reporting of any spill or leak in excess of one barrel as the hazardous materials release regulations (19 CCR §2620-2734). Facilities are regulated under APSA if the facility stores petroleum in an aboveground storage tank (AST), containers, or equipment of 55 gallons or more in shell capacity and the facility's total aboveground petroleum storage capacity is 1,320 gallons or more or the facilities has one or more petroleum tanks in an underground area. If subject to Aboveground Petroleum Storage Act, facilities are required to prepare and implement an SPCC Plan and complete a Tank Facility Statement annually.

3.9.2.13 Hazardous Waste and Substances Sites (Cortese) List (California Government Code §65962.5)

This state code requires the state to compile a hazardous waste and substance list. The Cortese List is used to comply with the CEQA requirements by providing information about the location of hazardous materials release sites. The Cortese List encompasses facilities on EnviroStor, GeoTracker, solid waste disposal sites, and Cease and Desist Orders/Cleanup and Abatement Orders sites.

3.9.2.14 Emergency Services Act of 2009

Under the Emergency Services Act, the state developed a plan to organize emergency services provided by federal, state, and local agencies. Rapid response to incidents involving hazardous materials or hazardous waste is a major component of the plan. California's Office of Emergency Services (CalOES) is responsible for the coordination of overall state agency response to major disasters in support of local government. The CalOES Hazardous Materials Section coordinates statewide hazardous materials accident prevention and emergency response programs for all types of hazardous materials incidents and threats. Releases of oil that threatens to cause harm to public health and safety, the environment, or property, require immediate notification and must be made to the CalOES Warning Center.

3.9.2.15 Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65; Health and Safety Codes Sections 25249.5 et seq.)

The Safe Drinking Water and Toxic Enforcement Act, enforced by OEHHA, requires businesses to notify the public about significant amounts of chemicals that are released into the environment. It also requires the development of health-protective exposure standards for different media (air, water, land) to recommend to regulatory agencies.

3.9.2.16 Assembly Bill 1376 (Bustamante) Field Rule

In 1998 under Assembly Bill 1376 (Bustamante), the Division of Oil, Gas, and Geothermal Resources (DOGGR, now CalGEM), Regional Water Quality Control Board, and CDFW established the “field rule”, or thresholds, for oil spill reporting.

3.9.2.17 California Pipeline Safety Act of 1981 (Cal. Gov. Code § 51010)

This California Pipeline Safety Act gives regulatory jurisdiction to the state Fire Marshall for the safety of all intrastate hazardous liquid pipelines and oil interstate pipelines used for the transportation of hazardous or highly volatile liquid substances. The law establishes the federal Hazardous Liquid Pipeline Safety Act (49 U.S.C. Sec. 2001 et seq.) and federal pipeline safety regulations as the governing rules for intrastate pipelines. This statute also authorizes the state Fire Marshal by agreement with the United States Secretary of Transportation, to implement the federal Hazardous Liquid Pipeline Safety Act and federal pipeline safety regulations as to those portions of interstate pipelines located within the state. It also establishes civil penalties for violations of the act or its regulations.

3.9.2.18 California Occupational Safety and Health Act of 1973 –Labor Code Section 6300-6332

Cal/OSHA is responsible for developing and enforcing the workplace safety regulations in Title 8 CCR, including the handling and use of chemicals in the workplace. Cal/OSHA hazardous materials regulations require safety training, availability of safety equipment, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation.

3.9.2.19 Senate Bill 1137 and Associated Referendum

In October 2022, the Governor of California signed into law SB 1137 which add Article 4.6, titled “Health Protection Zones,” to Chapter 1 of Division 3 of the Public Resources Code, Article 4.6 defined health protection zones as those areas within 3,200 feet of any active or idle oil and gas wells. The law set forth a series of new regulations for monitoring and operating all wells currently existing within a health protection zone, and prohibited CalGEM from issuing any permits for drilling new wells or redrilling existing wells within the health protection zone. A referendum in opposition to the legislation was filed with the Secretary of State in December 2022. On February 3, 2023, the Secretary of State certified that a sufficient number of signatures had been submitted for the referendum to become duly qualified for the ballot. The effectiveness of a statute challenged in its entirety by a duly qualified referendum is stayed until it has been approved by the voters at the required election. (Assembly of State of Cal. v. Deukmejian (1982) 30 Cal.3d 638, 656; Cal. Const., art. II, §§ 9, 10.) Thus, by operation of law, the implementation of SB 1137’s statutory provisions is stayed as of February 3, 2023, until the referendum challenge has been resolved by a vote of the electorate.

3.9.2.20 California Geologic Energy Management Division, Pipeline Management Plan

CalGEM oversees oil, natural gas, and geothermal industries in order to protect public health, safety, and the environment as well as achieve California's climate change and clean energy goals. CalGEM regulates drilling, operation, and permanent closure of energy resource wells. CalGEM requires operators to submit Pipeline Management Plans for evaluation of risk assessment (CalGEM 2019). SHP maintains a Pipeline Management Plan as part of their operations.

3.9.2.21 California Geologic Energy Management Division, Spill Contingency Plan (Title 14 Section 1722.9)

Spill contingency plans are required and intended to prevent and respond to unauthorized releases. There are specific guidelines on the requirements under this regulation which must be included in a spill contingency plan. Plans prepared pursuant to the USEPA's SPCC regulations may fulfill this spill contingency plan requirement if they contain all the required sections and are deemed adequate by CalGEM (CalGEM 2022). SHP is responsible for preparing spill contingency plans for facilities, which include any required information that is not already adequately described under the facility's SPCC plan. SHP maintains three separate spill contingency plans (i.e., Central, West, and East units) that cover their seven CUP 97-03 sites.

3.9.2.22 State of California Department of California Highway Patrol

The Department of California Highway Patrol oversees application and approval of licenses for transportation of hazardous materials for commercial operators. SHP is required to obtain a hazardous materials transportation license as part of Project operations.

3.9.2.23 County of Los Angeles Fire Department

The Los Angeles County Fire Department serves as the CUPA for SHP's operations, and the County Fire Code contains various provisions related to safety, site design, and access applicable to the Project. Additionally, due to the uniqueness of the oil field and pumping operations in the City, alternative methods of fire protection have been approved for oil and gas facilities within the City's jurisdiction. SHP would continue to adhere to the applicable regulations published by the County Fire Department.

The Health Hazardous Materials Division is a CUPA under the Los Angeles County Fire Department, that administers the following permit programs in Los Angeles County: Hazardous Waste Generator Program, Hazardous Materials Release Response Plans and Inventory Program, California Accidental Release Prevention Program, Aboveground Storage Tank Program, and Underground Storage Tank Program. The Los Angeles County Fire Department administers annual facility permits under these programs (Los Angeles County Fire Department 2022). SHP is required to obtain permits annually to operate facilities which are regulated under these programs. Each facility permit includes a list of the applicable programs.

As a CUPA, the County Fire Department implements the HMBP Program and is responsible for enforcement and administration. CalEPA oversees implementation of the HMBP program at the state level. SHP is required to submit HMBPs to the County Fire Department for review and approval as part of this program. SHP maintains six separate HMBPs for Drill Sites #1 through #5, and Drill Site #7 (approved on October 20, 2022). Drill Site #6 does not store hazardous materials, and therefore is not subject to the HMBP requirements. HMBPs are updated annually and submitted to the County Fire Department for review and approval, and these plans would continue to be updated as needed throughout the proposed 20-year life of the Project.

None of the drill sites have underground storage tanks, and none are proposed as part of this Project.

3.9.2.24 SCAQMD Rule 1166

Rule 1166 applies to facilities, including SHP’s CUP Sites, that have the potential for VOC leakage from storage and transfer operations, accidental spillage, or other deposition. This rule sets requirements to control the emission of VOCs from excavating, grading, handling, and treating VOC contaminated soil.

3.9.2.25 Signal Hill General Plan

The Environmental Resources Element (1986), Land Use Element (2001), and Safety Element (2016) of the City of Signal Hill General Plan address hazards and hazardous materials in goals and policies, as outlined in Table 3.9-1.

Table 3.9-1: Applicable City of Signal Hill General Plan Goals and Policies

Element	Goal	Policy	Applicability
Environmental Resources	Goal 5: Ensure minimal degradation to the physical environment from development or operational activities, and require restoration of the environment where degradation has occurred.	Policy 5.3: Eliminate the unsafe storage, use and transport of hazardous industrial and commercial chemicals and substances through regulations, planning and development review processes.	SHP maintains Hazardous Materials Business Plans for sites which store hazardous materials. SHP registers with the Department of Transportation to transport hazardous materials. SHP would continue to adhere to applicable regulations published by the County Fire Department.
Safety	Goal 1: Prevention: Strive to prevent man-made disasters and minimize the potential for natural disasters to impact the community.	Policy 1.c: Regulate the location, use, storage, and transportation of hazardous and toxic materials and protect the public from these hazards.	SHP maintains Hazardous Materials Business Plans for sites which store hazardous materials. SHP registers with the Department of Transportation to transport hazardous materials.

Element	Goal	Policy	Applicability
Land Use	Goal 3: Assure a safe, healthy, and aesthetically pleasing community for residents and businesses.	Policy 3.6: Provide for undesirable or hazardous commercial or industrial uses while avoiding concentrating those uses in close proximity to schools or residential neighborhoods, and ensure adequate monitoring of those uses, which involve hazardous materials to avoid industrial accidents, chemical spills, fire, and explosions.	Project sites are covered under Spill Prevention Control and Countermeasure Plans and spill contingency plans as required by CalGEM and USEPA.

Source: City 1986, 2001, 2016

3.9.3 Impact Assessment

The Initial Study for the Project determined that no impacts would occur regarding development of a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, or within an airport land use plan area. In addition, the Initial Study determined that the project would not physically interfere with an adopted emergency response plan or evacuation plan and would result in less than significant impacts with regard to wildland fire. Therefore, these issues are not addressed further in this EIR.

Please refer to the Air Quality impact assessment (Section 3.3.3.3), under AIR (c), for a discussion of impacts related to the potential for human health risk due to exposure to oil field chemicals and operations. In summary, consistent with OEHHA *Risk Assessment Guidelines* (2015), all residential and sensitive receptors were modeled with a 30-year exposure duration for future Project operation, as well as the aggregate health effects of continued operation of existing facilities (i.e., existing/baseline) activities plus additional future Project activities, and all business receptors were modeled with a 25-year exposure for baseline continued operation of existing facilities and construction and operation of additional Project components. As discussed in Section 3.3.3.2.2, for the purposes of the health risk analysis, additional Project operations are inclusive of the most conservative operations profile with the number of new wells and well cellars to be installed and existing wells to be redrilled at each drill site to match Table 2.4-8 and in use throughout the entire 20-year duration of the permitted operations. While this cumulatively assumes more drilling, redrilling and well cellar construction than is requested for this CUP Extension Project, the health risk at each drill Site is conservatively estimated to ensure that maximum impacts are determined. The Project’s health risk results were below the SCAQMD thresholds for potential cancer risk impacts, and non-cancer potential chronic and acute impacts. None of the emissions at any of the drill sites would result in health risks above established thresholds for any receptors located outside the drill site fence line.

HAZ (a). Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than Significant. As described in Section 2.4.1.5, SHP's existing operations involve routine transport of excavated soils from the drill sites to a permitted fully-lined staging area outside of the CUP Sites, located on California Ave. All excavated soils are measured for VOCs prior to transport, in accordance with SCAQMD Rule 1166, to ensure that no hazardous materials are placed in the staging area. If the VOC concentrations of excavated soils are above Rule 1166 thresholds, the soil is treated as hazardous materials. Additional testing is conducted at the staging area to determine if the soil meets the standards for reuse as clean fill material or if the soil must be disposed at a landfill. Therefore, the continued transport and staging of excavated soils at the California Ave site would not create a significant hazard to the public or the environment.

As discussed in Section 3.9.1, the existing operations currently occurring at all drill sites include the routine transport, storage, and use of hazardous materials. Vehicle transportation of hazardous materials is conducted in accordance with local and state regulations described under SHP's CHP Hazardous Materials Transportation License. Pipeline transportation of hazardous materials is conducted in accordance with SHP's PMP under CalGEM. While the proposed Project would continue to transport hazardous materials via motor vehicle or pipeline due to facilitate ongoing well drilling or well servicing, the type of material and the total quantity of hazardous materials transported will not change or increase beyond historical levels, nor would the continuation of existing oil and gas operations affect compliance with existing regulatory requirements and established plans for the transportation of hazardous materials as compared to SHP's existing operations. Note that the presence of additional wells does not require transport, store, or use additional hazardous materials once well drilling is completed.

The total quantity of certain materials stored at Drill Site #2 may slightly change or increase depending on the quantity of materials being processed within the new system at any given time. Specifically, the storage of natural gas liquids in the various new tanks/transmissions pipes, as well the storage and use of ethylene glycol in the LTS, may result in a slight increase in the total amount of hazardous materials transported by motor vehicle and pipeline to and from Drill Site #2. The potential increase in natural gas liquids storage will be sufficiently covered under the site's existing CUPA permit, SPCC Plan, CalARP/EPA Risk Management Plan/CalOSHA Process Safety Management program, which would be updated as needed following Project approval. As such, installation and operation of the proposed gas system modifications at Drill Site #2 would not impact compliance with SHP's regulatory requirements or established plans for the transportation of hazardous materials.

As discussed in Section 2.4.1.6 above, SHP stores and uses hazardous materials at all drill sites except for Drill Site #6, and hazardous materials have and would continue to be stored in

secondary containment and visually inspected weekly in compliance with the regulatory requirements. Applicable drill sites would continue to maintain HMBPs approved by the Los Angeles County Fire Department (CUPA) and under Los Angeles County’s Annual Unified Program Facility Permit. Consistent with existing operations, well drilling under the Project may require temporary storage of hazardous materials.

For new well drilling, re-drilling, and well bore cleaning (i.e., stimulation) at the drill sites, SHP has adopted and implements American Petroleum Institute’s Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations (API 2019) as its well drilling standard operating procedure. Consistent with SHP’s existing operations, additional hazardous materials would continue to be used and stored at the drill sites for short periods on an as needed basis, specifically while the drilling, re-drilling, as well as stimulation operation is occurring at a specific drill site. Per information provided by SHP, re-drilling of existing wells and drilling of new wells on average typically takes approximately one month, dependent upon the target depth of the well and specific geologic conditions encounter. Table 3.9-2 provides a summary of the hazardous materials used in well drilling and Table 3.9-3 details the hazardous materials used in well stimulation as well as average quantities stored. Note that while these are average quantities and that actual quantities may differ due to the well characteristics, these quantities accurately represent what has historically and will continue to be used onsite to support drilling, and re-drilling as part of the Project.

Table 3.9-2: Well Drilling Hazardous Materials

Material	CAS	Average Storage Quantity (lbs)	DOT Hazard Class	Physical Hazard	Health Hazard
2-Butoxyethanol	111-76-2	319	3	Combustible	T, I
Cocamide DEA	68603-42-	110	3	Combustible	C, I
DEA -Oleic Acid	68855-44-	55			
Diethanolamine	111-42-2	55	3	Combustible	C, T, I
Sodium (C10-C16)	68081-81-	110	-	-	I
Tall Oil (DTO)	8002-26-4	7,012	-	-	I
Petroleum distillates	64742-47-	3,218	3	Combustible	AH
Methanol	67-56-1	976	3	Flammable	AH, T, I
Calcium hydroxide	1305-62-0	10,025	-	-	T, I
Hydrocarbons, C11-	None	22,646	3	Combustible	AH
Distillates,	64742-53-	3,465	3	Combustible	AH, T, I
Quaternary	68953-58-	154	-	-	I
Calcium chloride	10043-52-	154	-	-	I

Source: Sespe Consulting, Inc. 2022d

Table 3.9-3: Well Stimulation Hazardous Materials

Material	CAS	Average Storage Quantity (lbs)	DOT Hazard Class	Physical Hazard	Health Hazard
methanol	0000067-	142	3	Flammable	AH, T, I
ammonium chloride	0012125-	17,387	-	-	T
xylene	0001330-	2,069	3	Flammable	AH, C, T, I
ethylbenzene	0000100-	621	3	Flammable	AH, C, T
toluene	0000108-	20	3	Flammable	AH, T, I
2-butoxyethanol	0000111-	196	3	Combustible	T, I
aromatic petroleum	0064742-	183	3	Combustible	AH, T, I
citric acid	0000077-	140	-	-	T, I
3-phenyl-2-propenal	0000104-	43	3	Combustible	T, I
nonylphenol	0127087-	125	3	Combustible	T, I
polyoxyethylene	0009014-	7	9	-	I
hydrochloric acid	0007647-	33,163	8	Corrosive	T, I
hydrofluoric acid	0007664-	396	8	Corrosive	T, I

Source: Sespe Consulting, Inc. 2022d

The hazardous materials and storage quantities anticipated for use in any future well drilling activities would be consistent with historical activities and would not trigger additional regulatory applicability. Once well drilling at a given drill site is complete, any hazardous materials temporarily stored to facilitate the onsite activities would be removed and properly stored within Drill Site #7. Additionally, while the proposed Project may slightly increase the quantity of hazardous materials stored in the modified gas system at Drill Site #2, this increase in storage would be nominal, would only potentially occur when the equipment is fully operational, and would not trigger additional regulatory applicability nor impact compliance with existing regulatory programs and permits as compared to SHP’s existing operations. Similarly, Construction of future well cellars would also not change or increase the amount of hazardous waste generated at the drill sites compared to historical levels. The only potentially hazardous waste would be generated from routine construction activities and ongoing equipment maintenance activities; however, consistent with existing operations, any additional hazardous materials used and stored at the drill sites would be covered under each drill site’s existing CUPA permit and would not trigger applicability to additional regulatory programs related to hazardous materials.

As discussed in Section 3.9.1 above, hazardous waste, mainly oily rags and oil filters from maintenance activities, would continue to be generated at Drill Sites #2 and #5 and handled and disposed of in accordance with state and local regulations. Because the existing operations would generally continue with no changes to existing/historical operations (other than the installation/operation of the proposed gas system modification at Drill Site #2), the proposed Project would not change or increase hazardous waste generation at the drill sites or cause new hazardous waste generation at an additional drill site. The operation of new wells that would be

drilled over time would not generate additional hazardous waste, as the waste generated is typically from maintenance activities at the drill sites. Further, the addition of new wells at the drill sites would not increase or change the required maintenance activities at the drill sites and the only hazardous waste that would continue to be produced would be oily rags and oil filters. The proposed Project would continue to maintain compliance with state and local regulations for hazardous waste disposal and would therefore have no new impact on hazardous material disposal as compared to SHP's existing operation.

As described in the paragraphs above, the proposed Project would not affect SHP's regulatory applicability to local, state, and federal hazardous materials regulations for transport, use, and disposal, compliance with the applicable programs and permits for hazardous materials, or hazardous waste generation at the drill sites as compared to existing operations. Other than nominal quantity of hazardous materials that might pass through the gas system modifications at Drill Site #2 while in operation, the total of quantity of hazardous materials utilized or stored and/or hazardous waste generated or stored would not change or increase because of the Project. As stated above, while the modifications to Drill Site #2 may slightly increase the amount of natural gas liquids and ethylene glycol stored in situ within the new equipment (i.e., LTS and backup membrane units) while in operation, this additional hazardous materials storage would be nominal, and would be sufficiently covered by the facility's existing HMBP and contingency plan(s). Therefore, there would be no new potential hazards associated with the routine transport, use, and disposal of hazardous materials because of the proposed Project, and potential impacts would be less than significant at all drill sites. No mitigation measures are required.

HAZ (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?

Less than Significant. SHP stores hazardous materials at all drill sites except for Drill Site #6 and stores hazardous wastes at Drill Sites #2 and #5. Hazardous materials and hazardous wastes are stored in secondary containment and visually inspected weekly in compliance with the regulatory requirements. In the event of a spill, SHP has a spill response procedure which outlines how SHP will contain the spill and minimize releases to the environment. SHP has absorbent physical barriers and absorbent material stored at all drill sites to contain and prevent spills from migrating and isolate the spill area if a spill occurs. Spills contained within tank enclosures or other containment are removed by vacuum truck or portable pump. SHP would also stop processes or operations or shut off water, gas, and/or electricity as needed to minimize the spill volume if/when a spill was to occur at a given drill site. If a spill has the potential to discharge off the property, SHP would notify the appropriate local agencies and use a spill contractor to respond to a release or threat of a release.

Furthermore, all drill sites except for Drill Site #5 are contained by existing perimeter block walls which would continue to prevent offsite discharges in the event of a spill and direct any potential releases toward the existing well cellars for containment, which continue to minimize potential releases to the environment. As discussed above, Drill Site #5 has secondary containment walls around all existing tanks, sumps, and weir systems to prevent stormwater or other runoff. The integrity of these existing secondary containment structures would continue to be inspected and maintained throughout the life of the Project.

Drill sites have and would continue to maintain HMBPs as applicable through the Los Angeles County Fire Department (CUPA) and permitted under Los Angeles County's Annual Unified Program Facility Permit. Additionally, as a part of the existing HMBPs, the applicable drill sites would continue to maintain approved emergency response and contingency plans for responding to and containing releases of hazardous materials. SHP would continue to maintain these existing plans and update them as needed to address regulatory requirements, including changes due to the proposed gas system modifications at Drill Site #2. For Drill Sites #2, #5, and #6, the existing SPCC Plan includes spill prevention procedures, controls, maintenance, and emergency response to prevent releases of oil sources. For Drill Site #2, SHP's existing CalARP and USEPA Risk Management Plan Program 3 Compliance Workbook includes procedures, controls, maintenance, and emergency response to prevent releases of flammable hazardous materials. Specifically, SHP maintains the required DOT FRP for responding to releases from onshore crude oil pipelines operated by SHP at all drill sites. SHP also follows American Petroleum Institute's Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations (2019) for well drilling, maintenance, and service of wellheads and maintains the required contingency plan to respond to releases. Well drilling permits require adequate well blowout protection to prevent releases of crude oil from wellheads. The drill sites, including Drill Site #2, would continue to operate in accordance with existing procedures, standards, and safety measures outlined in the SPCC Plans and other requirements, as applicable, throughout the life of the Project.

A risk of upset analysis was performed for proposed Project for common oil and gas facility upset scenarios that could affect public safety. The analysis assesses what upsets could occur based on historical project operations and changes to the drill sites due to the proposed Project. Table 3.9-4 summarizes the accident history since SHP began operation at the drill sites. For the proposed Project, the risk of upset, including potential release scenarios, is evaluated in Table 3.9-5.

Table 3.9-4: Accident and Upset History

Scenario	Applicable Drill Sites	History of Occurrence
Pipeline Leak or Rupture	All	No
Oil Spill / Leak	2, 5, 6	No
Fire and Explosion	2	No
Release of hazardous materials	1, 2, 3, 4, 5, 7	No
Wellhead area leak/rupture	All (during well drilling)	Yes ^a
Well blowouts	All (during well drilling)	No

Source: Sespe Consulting, Inc. 2022d

Notes:

^aDrill Site #2 had a past wellhead leak of brine water due to mechanical issues. The leak was non-hazardous and did not cause any injuries or fatalities.

Table 3.9-5: Risk of Potential Upset Analysis

Scenario	Applicable Drill Sites	Potential of Occur
Pipeline Leak or Rupture	All	Low
Oil Spill / Leak	2, 5	Low
Fire and Explosion	2	Low
Release of hazardous materials	1, 2, 3, 4, 5, 7	Low
Wellhead area leak/rupture	All (during well-drilling)	Low
Well blowouts	All (during well-drilling)	Low

Source: Sespe Consulting, Inc. 2022d

For all release scenarios analyzed for the continuation of existing operations, the proposed gas system modifications at Drill Site #2, and any future well drilling that would occur during the 20-year life of the Project, the potential for releases to occur as a result of the proposed Project would remain low based on historical accident and upset scenarios, SHP’s existing emergency response plans as described above, and SHP’s continued compliance with the applicable local, state, and federal regulations to prevent and prepare for releases of hazardous materials.

For these reasons as described above, the proposed Project will not create new hazards to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. SHP has and will continue to comply with applicable local, state, and federal hazardous materials regulations for releases. Through continued compliance with the applicable programs, procedures, and permits currently in place at the drill sites, the Project would result in no new impacts as compared to the existing baseline operations. Therefore, there would be no new potential hazards associated with upset and accident conditions involving the release of hazardous materials into the environment as a result of the proposed Project, and potential impacts would be less than significant at all drill sites. No mitigation measures are required.

HAZ (c). 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. Two existing drill sites are located within 0.25 miles of an existing school. Drill Site #6 and #7 are within 0.25 mile of Richard D. Browning High School. Existing chemicals required for operation of the drill sites include hazardous materials. Operations associated with new Project activities would require the same chemicals as ongoing operations. SHP has the required spill control and contingency plans as well as HMBPs, for sites which store hazardous materials, and would continue to update, maintain, and implement these plans as needed as part of ongoing operations. Accordingly, the proposed Project would not increase hazardous waste generation and would maintain compliance with applicable hazardous waste regulations. Therefore, continued operations would have a less than significant impact. Because the proposed Project would not change or expand the location or boundaries of the drill sites, nor affect compliance with hazardous materials and hazardous waste regulations, there would be no new impacts as a result of the proposed Project and potential impacts would be less than significant. No mitigation measures are required.

HAZ (g). Would the Project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Less than Significant. The drill sites are not located in “Very High Fire Hazard Severity” areas. According to the current Fire Hazard Severity Zone Maps published by the California Department of Forestry and Fire Protection, the Project site is located within an undesignated Fire Hazard Severity Zone (within a Local Responsibility Area). None of the adjacent areas are designated as “Very High”, “High” Fire Hazard Severity Zone. Additionally, the drill sites are located within a developed urban area and would not be especially prone to wildfires due to the lack of natural vegetation and open spaces.

As discussed above, the proposed Project is primarily the continuation of existing operations at the seven drill sites, plus the proposed gas system modifications within Drill Site #2. Occasional drilling and re-drilling will also continue to occur at individual drill sites as needed; however, the continuation of these existing on-going operations would not result in new on- or offsite physical changes that could expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. The Project would not require the use or storage of additional quantities of flammable materials onsite, and management of flammable materials stored onsite would continue to be conducted in accordance with applicable regulations. Additionally, SHP has an adopted emergency response plan that would be implemented in the event there is a wildland fire. For these reasons, the proposed Project would have a less than significant impact to the potential to expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. No mitigation measures are required.

3.10 Hydrology and Water Quality

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
X. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i. result in a substantial erosion or siltation on- or off-site;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii. 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; or	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv. impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.10.1 Environmental Setting

The City of Signal Hill is located within the boundaries of both the Los Cerritos Channel and the Lower Los Angeles River watersheds. The Los Cerritos Channel Watershed consists of a small, urbanized watershed that encompasses 17,711 acres in the Los Cerritos Channel and Alamitos Bay Watershed Management Area. This watershed includes the cities of Bellflower, Cerritos, Downey, Lakewood, Long Beach, Paramount, and Signal Hill as well as unincorporated land. Approximately 531 acres of Signal Hill is included in this watershed which makes up 3 percent of the total watershed area (Los Cerritos Channel Watershed Group 2017). This watershed has an associated watershed management plan. Signal Hill also comprises approximately 774 acres of the Lower Los Angeles River Watershed and is located within the Lower Los Angeles River Watershed Management Area which has an associated watershed management plan (Lower Los Angeles River Watershed Group 2015). The Newport-Inglewood Fault is the topographical

feature that dictates the direction that surface water drains into these two watersheds. Surface water runoff originating on Signal Hill's north side slope (north of the Newport-Inglewood Fault) generally flows into the Los Cerritos Channel Watershed, while the runoff from the south side slope generally flows into the Lower Los Angeles River Watershed (Sespe Consulting 2022a).

Los Angeles River Reach 1 is the closest surface water body to Signal Hill, located approximately 1.2 miles east from the City's eastern boundary. All surface water runoff is directed to surface water bodies outside the City via Municipal Separate Storm Sewer ("MS4") discharges. The City is surrounded by areas under the jurisdiction of the City of Long Beach; therefore, any discharges originating from within the City must pass through the City of Long Beach before reaching any receiving waters (Sespe Consulting 2022a). The City is served by two stormwater flood control facilities, the Hamilton Bowl and the California Bowl, which control major portions of the City's drainage before discharging to the MS4 and provide opportunities for urban-runoff capture, treatment, infiltration, and monitoring. Specifically, the Hamilton Bowl is a 15-acre flood control facility, owned and operated by the Los Angeles County Flood Control District. Approximately half of the City's stormwater runoff flows to the Hamilton Bowl where it is retained and eventually discharged into the Los Angeles River (Sespe Consulting 2022a).

3.10.1.1 Topography and Climate

The topography of Signal Hill is defined by the hill located in the central southeast portion of the City which formed along the Newport-Inglewood Fault Zone. Elevation in the City ranges from 25 feet above sea level in the southwest portion to 370 feet above sea level at the hilltop plateau (City 1986). Slopes generally vary from 10 to 80 percent, with the steepest slopes occurring along and adjacent to the Hilltop area. The greatest percentage of slope change occurs on the southerly slopes of Signal Hill with an average of 40 percent slope and increasing to as much as 80 percent slope. Slopes in the adjacent areas are more gradual and primarily ranges from 5 to 10 percent (City 1986).

The City is located within Southern California's coastal plain, and experiences a Mediterranean climate with warm, dry summers and mild winters. Historical climate data collected from the Western Regional Climate Center's Long Beach Daugherty Field Station for the period of January 1, 1949, to June 9, 2016, indicates an average monthly temperature maximum of 83.9°F for August and an average monthly minimum of 45.3°F for December. Average annual precipitation has historically been approximately 12 inches, with the most precipitation occurring between November and April (Sespe Consulting 2022a).

3.10.1.2 Surface Water

No surface water bodies exist within the City. The nearest surface water body is the Los Angeles River Reach 1, located approximately 1.2 miles east from the City's eastern boundary. All surface water runoff is directed to surface water bodies outside the City via Municipal Separate Storm Sewer ("MS4") discharges. Given the unique geography of the City, and that it is

surrounded on all sides by areas under the jurisdiction of the City of Long Beach, any discharges originating from within the City must pass through the City of Long Beach before reaching any receiving waters.

The City is also served by two stormwater flood control facilities, namely the Hamilton Bowl and the California Bowl; however, both basins also fall within the City of Long Beach. These two facilities control major portions of the City's drainage before discharging to the MS4 and provide opportunities for urban-runoff capture, treatment, infiltration, and monitoring. Specifically, the Hamilton Bowl is a 15-acre flood control facility, owned and operated by the Los Angeles County Flood Control District. Approximately half of the City's stormwater runoff flows to the Hamilton Bowl where it is retained and eventually discharged into the Los Angeles River (Sespe Consulting 2022a).

3.10.1.3 Groundwater

Signal Hill and the surrounding area overlie two main groundwater basins, the West Coast Basin and the Central Basin. These groundwater basins are separated from each other by the Newport-Inglewood Fault Zone, which partially restricts the flow of groundwater. Further, these two drinking water aquifers are separated geologically from the deeper zones in which SHP injects water by an impermeable aquitard (Flow Science 2014).

Signal Hill's water supply consists primarily of groundwater produced from the Central Basin and treated surface water. The City currently utilizes two groundwater production wells that make up approximately 90% of the water supply (City 2022b). Imported water is used as a supplemental supply during periods of high demand or in the case that a well is shut down for maintenance or other issues that may arise (City 2021a). The total pumping capacity of wells operated by the City is 3,585 gallons per minute. As stated in the City's Urban Water Management Plan, the newest well, Well No. 9, came online in October 2017 and is located within the City, northeast of the intersection of Cherry Avenue and 28th Street (City 2021a). The City drilled another well, Well No. 10 in 2022. Once Well No. 10 permitting by the Department of Water and Power, is completed and the well is online, the City water supply is expected to be wholly provided by groundwater (City 2021a). Drill Sites #2, #3, and #4 are located within approximately 0.5 mile of City Well No. 9.

The City pays a replenishment assessment to the Water Replenishment District of Southern California for each acre-foot of water that is pumped out of the Central Basin. The Water Replenishment District manages the groundwater replenishment and groundwater quality activities in 43 cities that overlie the Central Basin and West Coast Basin in southern Los Angeles County (WRD 2022).

Groundwater Quality

Historical over-pumping of groundwater (i.e., pumping water from the groundwater at a rate greater than it is replenished) has resulted in seawater intrusion, primarily in the West Coast

Basin, and seawater intrusion barriers and spreading grounds are being operated to minimize additional future impacts (Flow Science 2014). A review of groundwater samples collected from monitoring and production wells was conducted to characterize groundwater quality. Results showed that constituent concentrations in groundwater production zones were below applicable regulatory thresholds in the groundwater basins with the exception of total dissolved solids (TDS) and chloride primarily in the West Coast Basin, where seawater intrusion has resulted in exceedances of California's Secondary Maximum Contaminant Levels (MCLs) (Flow Science 2014). In their 2014 report, Flow Science also indicated that Superfund sites located in the Los Angeles basin have not impacted groundwater quality in the Signal Hill-Long Beach area and that contamination events and subsequent cleanups in the Signal Hill-Long Beach area appear to have been limited to soil and to shallow aquifers that are not used for drinking water production (Flow Science 2014).

SHP employs waterflood techniques to enhance oil recovery which involves using wells to inject fluid (primarily the water produced by SHP wells, that remains after all oil and gas has been separated from the fluids and this is reinjected back into the same formation from which it was produced with minor concentrations of non-hazardous additives to prevent well corrosion) into the reservoir to flush oil into extraction wells. All of SHP waterflood operations are conducted in accordance with CalGEM's approved UIC permit for the field, which requires that injected fluids are demonstrated to be contained both vertically and horizontally to the intended formation. SHP produces from the Repetto formation, approximately 3,600 feet below ground surface and over 1,000 feet below the overlying drinking water aquifer in the West Coast Basin. Based on their review, Flow Science concluded that the potential impacts of historical waterflood operations on drinking water aquifers are limited (Flow Science 2014). As described in Section 3.8, Geology and Soils, in 2019 CalGEM updated its Underground Injection Control Regulations. As part of its ongoing permit-by-permit review, CalGEM began review of SHP's Underground Injection Control permit in 2020 to ensure compliance with all provisions of the updated regulations, including an area of review analysis to ensure that no conduits exist which would allow the injected fluids to adversely affect underground sources of drinking water.

Overall, groundwater quality within the Central and West Coast basins remains very good in Water Year 2020-2021, with only some areas facing poor water quality from natural or anthropogenic sources (WRD 2022). Some of the water quality constituents were above the Primary MCLs, which are the drinking water standards established for public health. Some water quality constituents were above the Secondary MCLs, which impact the aesthetics of the water, such as taste, odor, and color, but do not impact health (WRD 2022). For constituents that do not have enforceable levels established, the CalEPA, SWRCB, Division of Drinking Water established health-based advisory levels known as Notification Level and Response Level.

The following water quality constituent maximums were detected above the Primary MCLs in the Central Basin based on data collected from Water Year 2018-2021 by DDW: arsenic (3 percent of sampled production wells), Trichloroethylene (9 percent of sampled production

wells, Tetrachloroethylene (6 percent of sampled production wells), perchlorate (1 percent of sampled production wells), and hexavalent chromium (3 percent of sampled production wells). In addition, the following water quality constituent maximums were detected above the Secondary MCLs based on data collected from Water Year 2018-2021 by Division of Drinking Water: iron (6 percent of sampled wells) and manganese (17 percent of sampled wells). Lastly, 1,4-dioxane was detected at concentrations above the Notification Level in 71 percent of production wells that were tested (WRD 2022).

Due to the quality of the groundwater in the Central Basin, minimal water treatment occurs prior to entering the potable water system. Groundwater quality is not expected to be a constraint on groundwater as a source of water in the future for the City (City 2021a). The City provides annual water quality reports which disclose the results of analyses of over 50 regulated and unregulated organic chemicals. None of these chemicals were detected at or above the reporting limit in groundwater or surface water sources in 2021 (City 2021b).

Groundwater Levels

On average, water levels fell by nearly four feet across the Water Replenishment District's service area⁷ in Water Year 2020-2021 (WRD 2022). In Water Year 2020-2021, groundwater levels decreased across the Central Basin with the greatest decrease occurring in the northern portion of the basin where water levels decreased by up to 20 feet compared to the previous year (WRD 2022). Decreases in water level ranged from three to 15 feet in other areas of the Central Basin, with much of the basin decreasing between one to five feet in groundwater elevation (WRD 2022). The City boundaries fall within the area with a decrease of one to five feet as well as areas of no significant change in groundwater elevation. Changes in groundwater levels within the West Coast Basin were variable in Water Year 2020-2021. Overall, water levels remained relatively unchanged from the previous year, and some areas have increased by up to four feet or decreased by two feet compared to Water Year 2019-2020. Overall, there was a loss in groundwater storage within the Central Basin of approximately 66,900 acre-feet in Water Year 2020-2021 due to drought, and there was no appreciable change in groundwater storage in the West Coast Basin (WRD 2022).

3.10.1.4 Flood Hazards

In general, Signal Hill is not subject to flood hazards and there are no special flood hazard areas in the City. Due to topography, infrequent but intense rainfall can present minimal flooding problems in parts of the City. Areas with the greatest potential for rainfall-related flooding are in localized areas to the south, southeast, and southwest of the Hilltop area (City 2016).

⁷ WRD's service area includes 43 cities that overlie the Central Basin and West Coast Basin in southern Los Angeles County.

According to the Federal Emergency Management Agency’s most recent Federal Insurance Rate Map all seven CUP sites are located in areas designated as Zone X, which indicates “areas of minimal flood hazard” (Sespe Consulting 2022a).

3.10.1.5 Drill Site Surface Runoff and Drainage

The CUP sites were designed for onsite containment of stormwater and other quantities of incidental water that may fall within the drill site boundaries using existing retaining walls, site design/drains, and stormwater BMPs. As such, except for Drill Site #5, it was determined that the drill sites have no potential for offsite discharge during storm events and, therefore, are exempt from the State’s Industrial General Permit and do not require Storm Water Pollution Prevention Plans (SWPPP). Specifically, the SWRCB has approved Notices of Non-Applicability (NONAs) for all drill sites apart from Drill Site #5. The Project would not include any changes to existing onsite drainage conditions or containment structures, and therefore there would continue to be no potential for offsite discharge at these sites.

Drill Site #5 maintains an active SWPPP (WDID Number: 4 19I025902). The existing SWPPP includes the following: specific prohibitions, effluent limitations, source identification, practice to reduce pollutants, assessment of pollutant sources, materials inventory, preventative maintenance program, spill prevention and response procedures, general storm water management practices, training, record keeping, sampling procedures and monitoring program. Stormwater best management practices (BMPs) which manage off-site sediment transport during operations and rain events are also outlined in the SWPPP. The SWPPP would continue to be implemented and updated as needed during Project operations.

All drill sites are located within a City drainage area (North, South, or West) as described in the Environmental Resources Element of the General Plan (City 1986), with the exception of Drill Site #1. CUP Site #1 is situated in a region north of the West Drainage Area that directs stormwater to the west, ultimately reaching the Los Cerritos Channel. The West Drainage Area generally conveys water either to the California Bowl Detention Basin via a storm drain south of Interstate 405 or a minor storm drain located on Columbia Street, which ultimately drain to the Lower Los Angeles River. Both the North and East Drainage Areas direct runoff toward a storm drain originating on East Spring Street that continues in a westerly direction into the City of Long Beach. Stormwater is carried through the City of Long Beach and ultimately is discharged to the Los Cerritos Channel. The South Drainage Area discharges most of its runoff into the Hamilton Bowl Detention Basin, which is fed by several storm drains including the 19th Street drain. All other runoff in the South Drainage Area is discharged south of the Pacific Coast Highway into the City the Long Beach. All runoff originating in the South Drainage Area ultimately discharges to the Lower Los Angeles River (Sespe Consulting 2022a). Table 3.10-1 provides the applicable City drainage areas and larger watersheds for each drill Site, as well as the onsite drainage conditions and general direction of runoff at each site.

Table 3.10-1: Drill Site Drainage Conditions and Watershed

Drill Site	Drainage Area	Existing Onsite Drainage Conditions	Watershed
#1	N/A	Flat site, within center of paved parking lot. Existing ground surface is compacted soils/gravel. Stormwater generally drains to the center of the site, where it's captured in the existing well cellar sump and recycled through the existing water separation/processing system. Other than small gaps where existing access gates are located (3 total), site is surrounded by an existing block wall, which contains stormwater/prevents offsite discharges.	Los Cerritos Channel
#2	West	Generally flat site the majority of which is paved. Other than small gaps where existing access gates are located (3 total), most of the site is surrounded by an existing block wall. Stormwater generally drains to the low-point in the northeast corner of the site, where it's captured in the existing well cellar sump and recycled through the existing water separation/processing system. The site generally does not discharge stormwater offsite.	Lower Los Angeles River
#3	North	Flat site with existing ground surface of compacted soils/gravel. Stormwater generally drains to the center of the site, where it's captured in the existing well cellar sump and recycled through the existing water separation/processing system. Other than small gaps where existing access gates are located (3 total), the site is surrounded by a block wall, which contains stormwater and prevents offsite discharges.	Los Cerritos Channel
#4	North	Entire site is paved and flat. Other than the small gaps where access gates are located (2 total), the site is surrounded by a block wall, which contains stormwater/prevents offsite discharges. Stormwater is directed toward the center of the site, where it is captured in the existing well cellar sump and recycled through SHP's existing water separation/processing system.	Los Cerritos Channel
#5	North	Existing topography gently slopes from south to north, to the northeast corner of the site toward Combella Drive and Temple Avenue/Obispo Avenue. Surrounded by a combination of existing block walls, concrete paneled fencing, and chain-link fences with silt fencing attached. Stormwater is gathered by a series of drains located throughout the facility and is gravity fed to a collection separator (weir box) prior to being discharged to a storm drain line. Stormwater that falls on the southeast portion of the site is also captured in the existing well cellar sump and recycled through the existing water separation/processing system.	Los Cerritos Channel
#6	South	Generally flat site, majority of which is paved. Surrounded by an existing block wall that contains stormwater/prevents offsite discharges. Stormwater generally drains to the center of the site, where it's captured in the existing drainage system.	Los Cerritos Channel
#7	South	Entire site is paved and generally flat. Other than small gaps where access gates are located (2 total), site is surrounded by an existing block wall which contains stormwater/prevents offsite discharges. Stormwater that falls on the eastern portion of the site is also captured in the existing well cellar sump and recycled through the existing water separation/processing system.	Lower Los Angeles River

Source: Sespe Consulting 2022a

3.10.2 Regulatory Setting

3.10.2.1 Clean Water Act

The Clean Water Act establishes the basic structure for regulating discharges of pollutants into the Waters of the United States and regulating quality standards for surface waters, including lakes, rivers, and coastal wetlands. The basis of the Clean Water Act was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. Under the Clean Water Act, USEPA has implemented pollution control programs and has developed national water quality criteria recommendations for pollutants in surface waters. In California, the SWRCB and its nine regional water quality control boards administer various sections of the Clean Water Act.

Section 402 of the Clean Water Act establishes the NPDES. Under Section 402, a permit is required for point source discharges of pollutants into navigable waters of the United States (other than dredge or fill material). Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. In California, the NPDES Permit program is administered by the SWRCB. These permits require development and adherence to SWPPPs, which include BMPs to control stormwater discharges.

Section 303 of the Clean Water Act requires that California adopt water quality standards. In addition, under Clean Water Act Section 303(d), states are required to identify “impaired waterbodies” (those not meeting established water quality standards), identify the pollutants causing the impairment, establish priority rankings for waters on the list, and develop a schedule for development of control plans to improve water quality. USEPA then approves the state’s recommended list of impaired waters or adds to and/or removes waterbodies from the list.

In accordance with Section 303(d) of the Clean Water Act, the SWRCB has listed both the Los Angeles River Reach 1 and Los Cerritos Channel as water quality impaired. Los Angeles River Reach 1 (Estuary to Carson Street) is water quality impaired for: indicator bacteria, cyanide, ammonia, cadmium, copper (dissolved), lead, nutrients (algae), trash, zinc (dissolved), and pH. The Los Cerritos Channel is water quality impaired for: ammonia, Bis(2ethylhexyl) phthalate, chlordane (sediment), copper, indicator bacteria, lead, trash, zinc, and pH (SWRCB 2022).

3.10.2.2 Federal Safe Drinking Water Act and California Underground Injection Control Regulations

CalGEM regulates oil and gas drilling activities to occur within a specified area that will have minimal impact underground due to the existing conditions of the natural resources found

there and determination that it will not impact clean water that can be used as a source of agricultural or drinking water. CalGEM, USEPA, and the SWRCB have jointly developed a process to ensure protection of aquifers that supply clean water for drinking or agricultural use are not impacted, as documented in the 1982 USEPA Primacy Agreement with the Division of Oil, Gas, and Geothermal Resources (now CalGEM) (Department of Conservation 2015) and the July 31, 2018 Memorandum of Agreement with the SWRCB (SWRCB and DOC 2018). The first step of the process involves with CalGEM and SWRCB concurring that an aquifer meets certain criteria set forth in PRC §3131 and § 146.4 of Title 40 of the Code of Federal Regulations, including documentation that the aquifer is not currently and would not in the future become a source of drinking water. Following concurrence and public review of the proposal, the agencies jointly submit the request for the exemption from the federal Safe Drinking Water Act to the USEPA, which makes the final determination. The final determination from USEPA is published in the form of a Record of Decision and Class II UIC permits may only be issued for projects that would inject fluids into those aquifers that are determined to not be underground sources of drinking water by the USEPA. The 2019 updated Underground Injection Control Regulations then ensure that oil and gas injection activities are authorized to inject fluids only in those formations that are exempt and that fluids are confined both vertically and horizontally to those defined areas.

3.10.2.3 Senate Bill 1281

In the context of severe drought, Senate Bill 1281 (2014, Pavley) expanded reporting requirements for the California oil and gas industry regarding produced water—the water extracted from oil and gas production—intending to ensure the ability to assess impacts on California’s water resources, public health, and the environment. Within the Executive Branch, this responsibility falls under CalGEM. CalGEM has posted data collected for years 2015-2017 on its website. This data indicates the total water produced by each well, total water injected, and the source of water used for injection and non-injection purposes at each field, by operator.

3.10.2.4 Porter-Cologne Water Quality Control Act

The Porter-Cologne Act requires the regional water quality control boards to adopt water quality control plans (Basin Plans) for the protection of surface water and groundwater quality. The Act also authorizes the RWQCBs to issue waste discharge requirements (WDRs), including NPDES Permits. Any activity, discharge, or proposed activity or discharge from a property or business that could affect California’s surface, coastal, or groundwater will (in most cases) be subject to WDR. The California Water Code authorizes the SWRCB and the RWQCBs to conditionally waive WDRs if this is in the public interest. For this Project, the Los Angeles RWQCB is the board with jurisdictional authority.

3.10.2.5 Industrial General Permit

The Industrial General Permit regulates industrial stormwater discharges and authorized non-stormwater discharges from facilities in California. Both the SWRCB and Regional Water Quality Control Boards enforce this permit. In order to comply with the NPDES General Permit for Storm Water Discharges Association with Industrial Activities, a SWPPP is required for oil and gas facilities (“...exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with any overburden, raw material, intermediate products, finished products, by-products, or waste products located on the site of such operations”) (SWRCB 2021). SHP maintains compliance with SWPPPs by implementing BMPs for both source controls and treatment controls, to reduce or eliminate pollutants in storm water runoff from facility properties. SWPPPs are submitted to the SWRCB through the SMARTS system.

The majority of the drill sites are exempt from the Industrial General Permit, in accordance with Section I.B.23 of the Regional Water Quality Control Board’s Industrial General Permit Order 2014-0057-DWQ and relatedly Section 402(I)(2) of the Clean Water Act. Specifically, all sites covered under CUP 97-03 are considered exempt from the Industrial General Permit through either an approved NONAs or through termination coverage, as the sites do not have the potential to discharge to Waters of the United States, with the exception of Drill Site #5, which currently maintains coverage under the Industrial General Permit and implements a SWPPP.

The area of disturbance for the gas processing system modification is estimated to be approximately 0.1 to 0.2 acres, which is similar to the disturbance area for new well cellars. Since this would be less than one acre, an NPDES General Construction Permit would not be required for the Project.

3.10.2.6 Waste Discharge Requirements

Regional Water Quality Control Boards oversees permitting for discharges of wastewater and stormwater, as well as water basin planning and regulatory programs to attain and maintain compliance with applicable water quality standards and objectives. The Regional Water Quality Control Board is responsible for permitting discharge of produced water to percolation and evaporation ponds, drilling sumps, and wastewater disposal sumps, through issuance of WDRs, or other forms of discharge authorization such as Clean Water Act Section 401 water quality certification and WDR waivers. In addition, the Regional Water Quality Control Board also oversees the cleanup of petroleum-related spills and releases, as well as spills and releases of other chemicals.

The drill sites do not have any Industrial Wastewater Permits (county or state), and produced water is collected, processed, and reinjected at the existing injection sites. No industrial wastewater is discharged from the existing facilities, nor would any discharges result from the Project.

3.10.2.7 Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties

The Los Angeles Regional Water Quality Control Board Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. The basin plan designates beneficial uses for surface and ground waters, sets objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state’s antidegradation policy, and describes implementation programs to protect all waters in the region (LARWQCB 2014).

3.10.2.8 Signal Hill General Plan

The Environmental Resources Element (1986) and Land Use Element (2001) of the City of Signal Hill General Plan addresses hydrology and water quality in goals and policies, as outlined in Table 3.10-2.

Table 3.10-2: Applicable City of Signal Hill General Plan Goals and Policies

Element	Goal	Policy	Applicability
Environmental Resources	Goal 5: Ensure minimal degradation to the physical environment from development or operational activities and require restoration of the environment where degradation has occurred.	Policy 5.2: Protect water quality and conserve water supplies through reducing and eliminating contamination from industrial operations or resource development activities. Cooperate and participate in regional water quality and water supply plans, programs and implementation measures.	Containment structures are used onsite which prevent spills.
Land Use	Goal 3: Assure a safe, healthy, and aesthetically pleasing community for residents and businesses.	Policy 3.18: Minimize the impacts of storm water runoff to the maximum extent practicable, on the biology, water quality and integrity of natural drainage systems and water bodies	Project would continue to implement SWPPP at Drill Site #5. Project would not include changes to existing onsite drainage conditions or containment structures.
		Policy 3.19: Maximize to the extent practicable, the percentage of permeable surfaces to allow more percolation of storm water runoff into the ground	Project would continue to implement SWPPP at Drill Site #5. Other drill sites would continue to have no potential for offsite discharge.
		Policy 3.20: Minimize to the extent practicable, the amount of storm water directed to impermeable areas and to the municipal separate storm water system. Build storm water pollution prevention systems into all development projects including maximizing landscaped areas and	Project would continue to implement SWPPP at Drill Site #5. Project would not include changes to existing onsite drainage conditions or increase runoff potential at any drill sites.

Element	Goal	Policy	Applicability
		providing areas for storm water storage and sedimentation.	
		Policy 3.21: Require new projects to include permanent controls to reduce storm water pollutant loads from development sites including parking lots to the maximum extent practicable.	Project would continue to implement SWPPP at Drill Site #5. Other drill sites would continue to have no potential for offsite discharge.

Source: City 1986, 2001

3.10.2.9 City of Signal Hill Municipal Code—Chapter 12.16

The intent of Chapter 12.16 of the Municipal Code is to protect public health, welfare, and safety and to reduce the quantity of pollutants discharged to Waters of the U.S. Specifically, the provisions outlined in Chapter 12.16 intend to accomplish the following:

- Eliminate non-storm water discharges to the municipal storm drain system;
- Eliminate the discharge of pollutants into the municipal storm drain system;
- Reduce pollutants in storm water discharges to the maximum extent practicable;
- Protect and enhance the quality of Waters of the U.S. in a manner consistent with provisions of the CWA; and
- Reduce contribution of pollutants from the MS4 through interagency coordination.

This chapter focuses on ensuring any commercial, industrial, or construction activity complies with all USEPA and SWRCB stormwater discharge requirements through pollutant reduction strategies, including BMPs and low impact development with emphasis put on compliance with the municipal separate storm sewer system (MS4) Permit.

3.10.2.10 Lower Los Angeles River & Los Cerritos Watershed Management Programs

The City of Signal Hill is a permittee under the Los Angeles RWQCB Order No. R4-2012-0175, adopted on November 08, 2012, which enacted WDRs for MS4 discharges within the coastal watersheds of Los Angeles County. The MS4 Permit established strict numerical limits regarding the quantity of pollutants that can be discharged by stormwater and urban runoff. To comply with the MS4 Permit, the City has submitted Watershed Management Programs for the Lower Los Angeles River and the Los Cerritos Channel watersheds. Both programs include a commitment to reduce the quantity of pollutants carried by soil and sediment.

3.10.2.11 Los Angeles County Department of Public Works – Hydrology Manual

The Hydrology Manual (Los Angeles County Department of Public Works 2006) establishes the Los Angeles County Department of Public Work’s hydrologic design procedures and techniques

that are applicable to the design of local storm drains, retention and detention basins, pump stations, and major channel projects. The standards set forth in the manual dictate all hydrology calculations done under Public Works' jurisdiction. The Project would not alter existing stormwater drainage or retention conditions at the CUP sites, and therefore the standards would not apply.

3.10.3 Impact Assessment

HYD (a). Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less than Significant. Most of the drill sites have been designed to contain stormwater or other quantities of incidental water that may fall within the site boundaries which is generally directed toward the existing well cellars/sumps or floor drain where it is contained and recycled through SHP's existing water separation/processing system. All sites covered under CUP 97-03 are considered exempt from the Industrial General Permit through either an approved NONAs or through termination coverage, as the sites do not have the potential to discharge to Waters of the United States, except for Drill Site #5, which currently maintains coverage under the Industrial General Permit and implements a SWPPP.

As part of ongoing operations, SHP would continue to maintain and follow HMBPs for sites that store hazardous materials (Drill Sites #1 through #5). Ongoing operations would not result in a change or increase in the quantities of hazardous materials used or stored onsite, apart from Drill Site #7. For Drill Site #7, SHP recently completed an HMBP to address changes in the quantities of hazardous materials used or stored at that site which was approved in October 2022. Note, CUP Site #6 does not store hazardous materials, and therefore is not required to maintain an HMBP.

In addition to the HMBPs, SHP also maintains three SPCC Plans which cover existing operations at all drill sites and would cover ongoing Project operations as well. The existing SPCC plans identify procedures, controls, devices, and facilities to prevent or minimize the release of petroleum products to surface water and groundwater. Produced water at the drill sites is collected, processed, and reinjected at the existing injection sites. No industrial wastewater is discharged from the existing facilities, nor would any discharges result from continued operations. As part of ongoing operations, redrilling activities would continue at the drill sites. However, all work would be completed in existing well cellars, and no new excavation would occur. SHP would not exceed the annual maximum number of redrilling operations in any given year over the 20-year continued operation period. As part of ongoing operations, SHP's SPCC plans would continue to be updated as needed throughout the proposed 20-year life of the Project. As such, the potential for the Project to impact surface water quality due to accidental releases or spills of hazardous substances is considered unlikely, as suitable measures would

continue to be implemented through the SPCC plans, in accordance with applicable federal and state regulations. Therefore, impacts would be less than significant.

New Project activities would not result in a change or increase in the quantities of hazardous materials used or stored onsite except for Drill Site #7, that is covered under a HMBP which addresses changes in the quantities of hazardous materials used or stored at that site. New Project activities would not change or increase onsite storage conditions; therefore, the existing SPCC plans and the spill prevention and containment measures included would remain sufficient for the Project. Although significant changes are not anticipated, following Project approval, the existing SPCC plan for the West Unit would be updated to include appropriate response and control measures for the proposed modification to the existing natural gas processing system at Drill Site #2. These plans would continue to be updated as needed throughout the proposed 20-year life of the Project. As such, the potential for the Project to impact surface water quality due to accidental releases or spills of hazardous substances is considered unlikely, as suitable measures would continue to be implemented through the SPCC plans, in accordance with applicable federal and state regulations.

Produced water at the drill sites is collected, processed, and reinjected at the existing injection sites. No industrial wastewater is discharged from the existing facilities, nor would any discharges result from Project construction. The existing SWPPP at Drill Site #5 would continue to be implemented and updated as needed. New Project activities would not result in any changes to existing onsite drainage conditions or containment structures. Accordingly, there would be no potential for new offsite discharges at Drill Sites #1-4 and #6-7, and discharges at Drill Site #5 would be in compliance with the Industrial General Permit and SWPPP. Therefore, potential impacts associated with the new Project activities, including drilling new wells and installing upgrades to the natural gas processing facility, are considered less than significant.

New Project activities would include drilling new wells, which would include construction of new ancillary well cellars. New well cellars are constructed by excavating a shallow hole (approximately 6-feet wide, 6-feet long, and 5-feet deep) using a back-hoe type excavator. Consistent with SHP's existing protocols, onsite areas where new well cellars are proposed would be inspected and monitored prior to and during excavation. In addition, drilling and redrilling operations would continue at the drill sites. Up to 46 new wells may be drilled over the 20-year period of the CUP. Standard industry BMPs would be implemented during construction activities to minimize the potential of exposing site soils to erosion and mobilizing sediments in stormwater as well as preventing the accidental release of hazardous materials such as fuels, oils, grease, and lubricants from construction equipment. With implementation of the standard industry BMPs, the potential for impacts to water quality from Project construction activities would be less than significant.

Based on a review of groundwater quality conducted for the City of Signal Hill, it was found that subsurface operations within the Signal Hill-Long Beach area to-date have little impact on water

quality within drinking water aquifers (Flow Science 2014). Ongoing Project operations would be the same as current operations, and therefore it is anticipated that impacts on groundwater quality would be less than significant. Since new Project activities and operations would be like current operations onsite, it is anticipated that impacts on groundwater quality as a result of the Project would also be less than significant.

New Project activities would not involve any changes to existing onsite drainage conditions, containment structures or hazardous materials storage at the drill sites except for Drill Site #7. SHP has and would continue to implement site-specific pollution and erosion control plans (i.e., SPCCs, HMBPs, SWPPPs) at the currently applicable drill sites. New Project activities would occur within the existing facility footprints and would not involve activities that would otherwise impact surface or groundwater quality or violate RWQCB water quality standards and WDRs. Therefore, there would be no new potential for offsite discharge and impacts to water quality at the drill sites as a result of the Project, and potential impacts at these drill sites would remain less than significant.

HYD (b). Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Less than Significant. Water produced by the production wells is 100 percent recycled for secondary recovery/waterflood operations in accordance with SHP's active Class II Underground Injection Control permit. Produced water at the drill sites is collected, processed, and reinjected at the existing injection sites. SHP's current operations consume an average of 9,500 gallons of potable water per day on normal operating days, which is the amount currently supplied by the City of Signal Hill. Redrilling operations do not require additional water. Ongoing Project operations would not result in an increase in potable water use and therefore impacts would be less than significant.

An additional 2,100 gallons per day is required when new wells are being drilled which is an approximately 22 percent increase compared to normal operating days (redrilling does not consume additional water resources). SHP estimates that over the 20-year CUP period, it would drill up to 46 new wells (total of all new wells at the seven sites). The maximum number of new wells that would be drilled in any given year is five, and the average number of new wells that would likely be drilled in any given year is two. Depending on the target depth of the well and specific geologic conditions encountered, on average drilling a new well can be completed within a month. Assuming a total of 20 drilling days per month, this would require approximately 42,000 gallons of water in addition to normal operations to complete one new well. The proposed gas system modifications at Drill Site #2 would not increase water use for the Project. Following completion of drilling, no future change in potable water use or produced water recycling/reinjection would occur as a result of the new Project activities.

In 2020, the City's potable water demand was 1,918 acre-feet (AF) and the City's groundwater right in the Central Basin is 2,022 acre-feet per year (AFY) (City 2021a). The City's groundwater production wells make up approximately 90 percent of the water supply (City 2022b), and in 2020, the City's potable water supply was 97 percent groundwater and 3 percent imported water (City 2021a). If the maximum number of new wells were drilled in a given year, this would result in a new demand of approximately 0.64 AF additional water, which represents approximately 0.03 percent of the City's overall groundwater right in the Central Basin. Accordingly, new Project activities would not substantially decrease groundwater supplies or interfere with groundwater recharge and, therefore, impacts would be less than significant.

HYD (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 or through the addition of impervious surfaces, in a manner which would:

i. Result in a substantial erosion or siltation on- or off-site;

Less than Significant. Continued Project operations would not result in any changes to the existing drainage patterns onsite. Stormwater BMPs which manage off-site sediment transport during operations and rain events are implemented at Drill Site #5, which is the only site that discharges offsite. During ongoing operations, SHP would continue to maintain existing containment/drainage structures and implement site-specific erosion control plans (i.e., SWPPPs) and related BMPs as applicable. Therefore, ongoing operations would have a less than significant impact.

New Project activities, including drilling new wells and upgrades to the natural gas processing facility, would not alter the existing drainage patterns onsite. The new natural gas processing equipment would generally be installed on top of existing paved surfaces with minimal ground disturbance for underground process piping, electrical conduits and control cable conduits as well as reinforced concrete foundations for each piece of equipment which would be entirely within the existing containment boundary of Drill Site #2. Installation of the gas system structures would not create new slopes, permanently exposed soil, or other topographic conditions which could increase the chance of surface runoff or erosion/siltation. Additionally, the natural gas processing system modification would not increase the amount of total paved surfaces or introduce new onsite features that would alter the existing drainage pattern at Drill Site #2.

Construction of additional well cellars for drilling new wells would be constructed within the boundaries of the drill sites, and in accordance with the City's setback requirements. Consistent with SHP's existing protocols, onsite areas where new well cellars are proposed are inspected and monitored prior to and during excavation. Well cellar excavation, monitoring, and soil evaluation/sampling would continue to be conducted in accordance with applicable City, state, and federal regulations. Once constructed, the new well cellar would act as a containment structure and therefore increase the containment capacity of the given drill site. During

construction and ongoing operations for new Project activities, SHP would continue to maintain existing containment/drainage structures and implement site-specific erosion control plans (i.e., SWPPPs) and related BMPs as applicable. New Project activities would not substantially alter the existing drainage pattern of the drill sites or surrounding areas through alteration of existing streams, rivers or through the addition of impervious surfaces, and therefore impacts would be less than significant.

ii. *Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;*

Less than Significant. The drill sites were designed for onsite containment of stormwater and other quantities of incidental water that may fall within the drill site boundaries. Therefore, most drill sites have no potential for offsite discharge during storm events and are exempt from the State’s Industrial General Permit and do not maintain SWPPP. Drill Site #5 operates under a SWPPP and SHP implements BMPs related to stormwater discharge. Therefore, ongoing Project operations would have a less than significant impact.

New Project activities would not include any changes to existing onsite drainage conditions or containment structures, and therefore there would continue to be no potential for offsite discharge at these sites. Drill Site #5 would continue to be operated under a SWPPP, and SHP would continue to implement BMPs related to stormwater discharge under the construction and operation of new Project activities. Therefore, new Project activity impacts related to surface runoff and offsite flooding would be less than significant.

iii. *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;*

Less than Significant. Ongoing Project operations would not include any changes to existing onsite drainage conditions or containment structures, and therefore there would continue to be no potential for offsite discharge at Drill Sites #1-4 and #6-7. As part of the SWPPP, SHP implements BMPs at Drill Site #5 to reduce the potential for polluted runoff due to contact with onsite chemicals including petroleum, automotive coolant, hydraulic fluid, gasoline, diesel fuel, and small amounts of general maintenance products. The sources of potential pollution from this facility are crude petroleum, lubricants and coolant from any vehicles or equipment that are used onsite. In general, all petroleum is enclosed in tanks that are also surrounded by a secondary containment. All chemicals located onsite are contained within covered containers, which are placed within secondary containment structures. Therefore, these chemicals are not considered to be potential sources of storm water pollution from this facility. Stormwater that falls onto the site is gathered by a series of drains located throughout the facility and is gravity-fed to a collection separator (weir box) prior to being discharged to a storm drain line. As part on ongoing operations, SHP would continue to implement BMPS for loading/unloading of materials which can pollute stormwater; outdoor equipment/material storage areas; industrial

parking lots, access roads, and other paved areas; oil well production and drilling rig operations; and stormwater management. No vehicle/equipment fueling, maintenance, or cleaning is conducted onsite and therefore no BMPs are required for these operations. Impacts due to ongoing Project operations would be less than significant.

New Project activities would not include any changes to existing onsite drainage conditions or containment structures, and therefore there would continue to be no potential for offsite discharge at Drill Sites #1-4 and #6-7. SHP would continue to implement BMPs at Drill Site #5 to reduce the potential for polluted runoff due to contact with onsite chemicals. With continued implementation of these BMPs, impacts associated with new Project activities would be less than significant.

HYD (d). In flood hazard, tsunami, or seiche zones, would the Project risk release of pollutants due to project inundation?

Less than Significant. The drill sites are designated by FEMA as Zone X, which are areas of minimal flood hazard, and are not located in a tsunami or seiche zone (CDOC 2022, City 2016). With minimal flood hazards at the drill sites, and no water features on or nearby the sites that would cause substantial flooding, the risk of pollutant release due to drill site inundation during ongoing Project operations as well as new Project activities is less than significant.

HYD (e). Would the Project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less than Significant. Both the Central and West Coast basins are listed in the very low priority category by the Department of Water Resources and therefore are not required to develop groundwater sustainability plans (DWR 2022). However, the Water Replenishment District developed the Groundwater Basins Master Plan for the West Coast and Central groundwater basins, which aims to identify projects and programs to enhance basin replenishment, increase reliability of groundwater resources, improve and protect groundwater quality, and ensure that the groundwater supplies are suitable for beneficial uses (WRD 2016).

As part of continued operations at the drill sites, SHP would implement site-specific BMPs to protect surface and ground water quality and would continue to comply with existing conditions of approval to ensure operations would not adversely impact water resources. Therefore, impacts would be less than significant.

New Project activities would not obstruct implementation of a water quality control plan or sustainable groundwater management plan, as construction and operations would not impair any beneficial uses or degrade water quality. As described under HYD (a) above, the Project would have a less than significant impact on water quality. The Project would implement BMPs during construction as well as part of the SWPPP for Drill Site #5 which has stormwater discharges to prevent impacts on water quality. Additionally, the Project would have no potential for new offsite runoff or create new onsite conditions with the potential to adversely

impact water quality in violation of applicable regulations and management plans. New Project activities would not result in new waste streams or discharges that would be subject to regulation under an applicable water quality control plan. SHP would continue to implement site-specific BMPs to protect surface and ground water quality and would continue to comply with existing conditions of approval to ensure operations would not adversely impact water resources. Therefore, impacts would be less than significant.

3.11 Noise

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. Noise. Would the project:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) For a project located within the vicinity of a private airstrip or 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.11.1 Environmental Setting

3.11.1.1 Definitions

The following terms are employed in this noise impact assessment:

- Decibel (dB): A unit division, on a logarithmic scale, whose base is the tenth root of ten, used to represent ratios of quantities proportional to power. In simple terms, if the power is multiplied by a factor of ten, then ten is added to the representation of the power on the decibel scale. If 0 dB represents 1 unit of power, 30 dB represents one thousand units, 60 dB represents one million units, etc.
- A-Weighted Sound Level (dBA): Sound pressure level measured using the A-weighting network, a filter which discriminates against low and very high frequencies in a manner similar to the human hearing mechanism at moderate sound levels. The A-weighted sound level is generally used when discussing environmental noise impacts.

- L_{50} , L_{25} , $L_{8.3}$, $L_{1.7}$: The A-weighted noise level that is equaled or exceeded by the designated percentage of time within the sample. In other words, L_{50} is the noise level that is exceeded 50% of the time (i.e., 30 minutes in an hour), L_{25} is the noise level exceeded 25% of the time (i.e., 15 minutes in an hour), $L_{8.3}$ is exceeded 8.3% of the time (i.e., 5 minutes in an hour), etc.
- Maximum Noise Level (L_{max}). The instantaneous maximum noise level measured during the sample period.
- Equivalent Continuous Noise Level (L_{eq}). The average noise level over a designated time period. This is often referred to as "equivalent sound level", hence the "eq" subscript. The "equivalence" is to a sound of constant level that has the same total acoustic energy content.
- Ambient (i.e., Background) Noise Level: The current noise level in the vicinity of the proposed Project that results from the combination of all sources, near and far. Please note, ambient noise measurements presented in this Noise Impact Analysis include noise generated by SHP's existing permitted operations under CUP 97-03 (see Section 3.2).
- Noise-Sensitive Receptors: Per the City of Signal Hill – General Plan, noise-sensitive receptors are those uses that have associated human activities that may be subject to stress or significant interference from noise. Potentially sensitive uses as designated by the City primarily include residences, schools, churches, and libraries.
- Day-Night Average Level (L_{dn} – dBA): The long-term time average sound level, weighted as follows:
 - Frequency response is filtered using the A-weighting network.
 - Daytime noise (7:00 a.m. to 10:00 p.m.) is not weighted.
 - Nighttime noise (10:00 p.m. to 7:00 a.m.) is weighted by +10 decibels.
- Community Noise Equivalent Level (CNEL – dBA): The long-term time average sound level, weighted as follows:
 - Frequency response is filtered using the A-weighting network.
 - Daytime noise (7:00 a.m. to 7:00 p.m.) is not weighted.
 - Evening noise (7:00 p.m. and 10:00 p.m.) is weighted by +5 decibels.
 - Nighttime noise (10:00 p.m. and 7:00 a.m.) is weighted by +10 decibels.

3.11.1.2 Local Noise Environment

The drill sites are located throughout the City, within developed urban areas, adjacent to lands designated for industrial, commercial and residential uses. Noise at and around the Project area is characteristic of a densely populated urban area, with major noise sources being Interstate

405; Pacific Coast Highway; and noise from aircraft taking off from and landing at the Long Beach Airport, which is located roughly one mile northwest of Drill Site #5.

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels, and because of the potential for nighttime noise to result in sleep disruption. Additional land uses such as schools, transient lodging, historic sites, cemeteries, and places of worship are also generally considered sensitive to increases in noise levels. These land use types are also considered vibration-sensitive land uses, as are commercial and industrial buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance.

Noise measurements at the closest receptors in each direction from the drill sites were evaluated. To quantify the existing ambient (i.e., baseline) noise environment experienced at applicable property lines and receptors closest to the Project, a total of ten 24-hour noise measurements were collected at eight locations surrounding each drill site over the course of two weeks (beginning April 12th, 2022, and ending April 27th, 2022). Measurements at these closest receptors conservatively account for other potentially affected receptors located farther from the Project site(s) and equipment noise sources. The complete noise technical report is included as Appendix I. The locations of the baseline noise measurements and the corresponding Project site receptors are summarized in Table 3.11-1.

Table 3.11-1: Summary of Site Receptor Locations

Drill Site	Receptor	Receptor Type	Description
Drill Site #1	R1	Residence	Residential neighborhoods located east of CUP Site #1, across Atlantic Avenue.
	R2	Commercial	Commercial receptor located immediately northeast of CUP Site #1, within the Gateway shopping center.
	R3	Commercial	Commercial receptor located immediately northwest of CUP Site #1, within the Gateway shopping center.
	R4	Commercial	Commercial receptor located immediately south of CUP Site #1, within the Gateway shopping center
Drill Site #2	R5	Commercial	Commercial receptor located south of CUP Site #2, across E. 29th Street.
	R6	Commercial	Commercial receptor located east of CUP Site #2.
	R7	Industrial	Industrial receptor located north of CUP Site #2, across E. Spring Street.
Drill Site #3	R8	Residence	Residential apartment complex located southwest of CUP Site #3, across the intersection of Walnut Avenue and E. Willow Street.

Drill Site	Receptor	Receptor Type	Description
	R9	Commercial	Commercial receptor located southwest of CUP Site #3, across E. Willow Street.
	R10	Commercial	Commercial receptor located west of CUP Site #3, across Walnut Avenue.
	R11	Commercial	Commercial receptor located east of CUP Site #3.
	R12	Industrial	Industrial receptor located northeast of CUP Site #3.
Drill Site #4	R13	Residence	Residential apartment complex located northeast of CUP Site #4, across the intersection of Junipero Avenue and Combella Drive.
	R14	Commercial	Commercial receptor located north of CUP Site #4.
	R15	Commercial	Commercial receptor located immediately west of CUP Site #4.
Drill Site #5	R16	Residence	Residential neighborhoods located north of CUP Site #5, across Combella Drive.
	R17	Residence	Residential neighborhoods located immediately east of CUP Site #5.
	R18	Residence	Residential neighborhoods located southwest of CUP Site #5.
Drill Site #6	R19	Residence	Residential neighborhoods located north of CUP Site #6, across 20th Street.
	R20	Residence	Residential neighborhoods located northeast of CUP Site #6, across the intersection of 20th Street and Redondo Avenue.
	R21	Commercial	Commercial receptor located immediately west of CUP Site #6.
Drill Site #7	R22	Commercial	Commercial receptor located immediately east of CUP Site #7.

Table 3.11-2 presents the ambient noise levels measured near the receptors within the Project site vicinity on April 12th through the 14th, and April 25th through 28th, 2022. Noise from the SHP's existing operations under CUP 97-03 were captured in the ambient noise levels, as the drill sites were operating while the measurements were taken. Table 3.11-2 summarizes the daytime (7:00 a.m. – 10:00 p.m.), nighttime (10:00 p.m. – 7:00 a.m.), and 24-hour average (L_{eq}) exterior noise levels, as well as 24-hour CNEL exterior noise level measured within the vicinity of the drill sites/Project receptors. The ambient noise level metrics shown in Table 3.11-2 are utilized to address the applicable Signal Hill and Long Beach criteria.

Table 3.11-2: Ambient Noise in Project Vicinity

Drill Sites/Receptors	Average Daytime L_{ew} (7:00 a.m.-10:00 p.m.) (dBA)	Average Nighttime L_{ew} (10:00 p.m.-7:00 a.m.) (dBA)	24-Hour L_{eq} (dBA)	CNEL (dBA)
Drill Site #1 (R1 – R4)	74.4	61.9	72.4	73.7
Drill Site #2 (R5 – R7)	66.7	66.3	66.5	73.0
Drill Site #3 (R8 – R12)	58.5	56.8	57.9	63.7

Drill Sites/Receptors	Average Daytime L_{ew} (7:00 a.m.-10:00 p.m.) (dBA)	Average Nighttime L_{ew} (10:00 p.m.-7:00 a.m.) (dBA)	24-Hour L_{eq} (dBA)	CNEL (dBA)
Drill Site #4 (R13 – R15)	69.3	59.5	67.5	69.5
Drill Site #5 (R16 – R18)	57.8	55.1	57.0	62.3
Drill Site #6 (R19 – R21)	59.8	52.5	58.2	61.7
Drill Site #7 (R22)	57.8	56.8	57.5	63.5

Source: Sespe 2022b

3.11.2 Regulatory Setting

3.11.2.1 Federal Standards

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972 (42 U.S.C. §4901 et seq.), which serves three purposes:

- Establish noise emission standards for interstate commerce.
- Assist state and local abatement efforts.
- Promote noise education and research.

The Federal Office of Noise Abatement and Control was initially tasked with implementing the Noise Control Act. However, the Office of Noise Abatement and Control has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency prohibits exposure of workers to excessive sound levels. The Department of Transportation assumed a significant role in noise control through its various operating agencies, including the Federal Aviation Administration (FAA), Federal Transit Administration (FTA), and Federal Highway Administration (FHWA).

The FAA regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the FTA (formerly the Urban Mass Transit Administration). Transit noise is regulated by the FTA, while freeways that are part of the interstate highway system are regulated by the FHWA. Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that “noise sensitive” uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the Federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, counties and cities are restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

3.11.2.2 State Standards

Established in 1973, the California Department of Health Services Office of Noise Control was instrumental in developing regulatory tools to control and abate noise for use by local agencies. One significant model is the “Land Use Compatibility for Community Noise Environments Matrix,” which allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

Article 4 of the California Administrative Code (California Noise Insulation Standards, Title 24, Chapter 1) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that prevent interior Day-Night (L_{dn}) or CNEL noise levels from exceeding 45 dBA. When such structures are located within a 60-dBA Day-Night (L_{dn}) or CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA limit.

Government Code §65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable. Figure 5 within the City of Signal Hill’s General Plan – Noise Element presents “Community Noise Exposure Levels” is based upon the Governor’s Office of Planning and Research (OPR) 2003 guidance, which incorporates this concept. See Section 3.11.2.3 for additional detail.

3.11.2.3 City of Signal Hill – General Plan

The City of Signal Hill General Plan (City of Signal Hill 2009a), Noise Element, has several goals and policies related to noise. City General Plan noise policies that apply to the Project are summarized in Table 3.11-3.

Table 3.11-3: Applicable City of Signal Hill General Plan Goals and Policies

Element	Goal	Policy	Applicability
Noise	Goal 1: Protect the health, safety, and welfare of people living and working within the city from adverse noise impacts.	<p>Policy 1.a: The City will consider the severity of noise exposure in the community planning process to prevent or minimize noise impacts to existing and proposed land uses.</p> <p>Policy 1.d: The City will inform those living and working within the city of the effects of noise pollution and will cooperate with all levels of government to reduce or minimize impacts.</p> <p>Policy 1.e: Require noise mitigation to ensure that noise-sensitive land uses are</p>	The Project would be subject to City regulations and applicable noise limits.

Element	Goal	Policy	Applicability
		<p>not exposed to noise levels of greater than 45 dB in habitable rooms and 65 dB in outdoor living areas.</p> <p>Policy 1.f: Where needed, the City will encourage the use of noise mitigation methods that minimize visual impacts and maintain necessary access.</p>	

Source: City of Signal Hill 2009a

In addition to the goals and policies above, the Noise Element of the General Plan also outlines general standards for assessing compatibility of various land use types with a range of noise levels. Specifically, Implementation Program – Number 16 indicates that the City should “require an acoustical analysis report where the introduction or addition of a new noise source has the potential to result in exterior noise levels exceeding 60 dB CNEL at a noise-sensitive location. The report must show how noise mitigation measures have been incorporated into the design of the new noise source to reduce interior noise levels at noise-sensitive locations to 45 dB CNEL” (City of Signal Hill 2009a). Table 3.11-4 was also taken from the General Plan and summarizes noise level compatibility criteria for various land uses.

Table 3.11-4: Signal Hill General Plan – Noise Compatibility Criteria by Land Use

Land Use Type	Interior/Exterior	Compatibility Criteria
Residential	Exterior	Outdoor living areas must be mitigated to 65 dB CNEL or less.
Residential	Interior	Habitable rooms must be mitigated to 45 dB CNEL or less.
Other Noise-Sensitive Uses	Exterior	Same as residential criterion.
Other Noise-Sensitive Uses	Interior	Same as residential criterion.
Commercial	Exterior	A noise level of 70 dB CNEL or less, or one that does not interfere with normal business activity.
Industrial	Exterior	A noise level of 75 dB CNEL or less, or one that does not interfere with normal business activity.

Source: City of Signal Hill 2009a

Lastly, the Signal Hill General Plan also contains a subsection describing the local noise environment pertaining to existing oil and gas operations within the City. This section of the General Plan contains relevant background information and source noise monitoring data related to drilling, pumping, and well-servicing activities which are regulated by the City’s Oil and Gas Code (see Section 3.11.2.4 below). Information and reference data taken from this section of the General Plan has been incorporated into this EIR as applicable (see Section 3.11.3 below).

3.11.2.4 City of Signal Hill – Municipal Code

The City of Signal Hill – Municipal Code, specifically Title 9 (Public Peace, Morals and Welfare) and Title 16 (Oil and Gas Code), also contain various provisions that regulate both construction and operational noise from stationary and mobile sources. Applicable Signal Hill – Municipal Code noise and vibration standards and related information/policies are summarized below.

– Title 9 – Public Peace, Morals and Welfare, Chapter 9.16 (Noise)

- 9.16.020 – Definitions. The following terms used in this chapter, unless the context clearly indicates otherwise, shall have the respective meanings set forth in this section:

A. "Ambient noise" means the all-encompassing noise associated with a given environment, being usually a composite of sounds from many sources near and far. For the purpose of this chapter, "ambient noise level" is the level obtained when the noise level is averaged over a period of fifteen minutes without inclusion of noise from isolated identifiable sources, at the location and time of day near that at which a comparison is to be made.

B. "Ambient noise level" as referred to in this chapter, means the higher of the following:

1. Actual measured ambient noise level; or
2. Presumed ambient noise level as determined from the following chart:

Zone	Night (10 p.m. to 7 a.m.)	Day (7 a.m. to 10 p.m.)
Residential	50	60
Commercial	60	65
Industrial	70	70

- 9.16.030 – Noise standards.

A. Notwithstanding any other provision of this chapter, and in addition thereto, it is unlawful for any person to willfully make or continue, or cause to be made or continued, any loud, unnecessary, or unusual noise which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness in the area.

- 9.16.050 – Construction or repairing of buildings.

A. Generally. It is the purpose of this section to promote quiet and peaceful residential areas by limiting construction activities which create disturbing noise to reasonable times and circumstances, but such limitations shall not apply where residences will not be

affected, where individual homeowners are performing maintenance work, or to emergency circumstances.

B. Limitation of Activity. No person shall carry on any construction activities, including the erection, demolition, excavation, modification, alteration or repair of any building or structures, or any other activities creating construction noise as defined in this section other than between the hours of seven a.m. and six p.m. on weekdays, except as otherwise permitted in this section.

C. Definitions. For the purposes of this section, the following words and phrases shall have the following meanings, except where the context indicates otherwise:

a. The term "weekday" does not include Saturdays, Sundays or holidays, but does include all other days. "Holidays" is defined in this section to include the following seven days: Christmas, Thanksgiving, New Year's, July 4th, Memorial Day, Labor Day and Veterans Day.

D. Exceptions. Notwithstanding any other provision of this section, construction activities are permitted as follows:

3. Construction activities creating construction noise may be authorized between the hours of six p.m. and seven a.m. on weekdays or at any time on any other days if a permit for such construction activities is issued by the building official of the city or his designee in accordance with the provisions contained in this section, and is not revoked.

- 9.16.060 – Machinery and equipment other than that required for servicing, redrilling and reworking of existing oil wells.

A. It is unlawful for any person to operate any machinery, equipment, compressor, pump, generator, fan, air conditioning apparatus, or similar mechanical device, or provide boarding or daycare to animals in an enclosed building (kennel) in any manner so as to create any noise which would cause the noise level at the property line of any property to exceed the ambient noise level by more than five decibels.

B. This section shall not prevent the normal operation, repair, or maintenance of household gardening equipment and hobby shop equipment or the servicing, redrilling and reworking of oil wells.

- 9.16.070 – Servicing, reworking and redrilling of existing oil wells.

A. Except in case of emergency well work, well servicing reworking and truck deliveries are prohibited except Monday through Friday, inclusive, from seven a.m. to seven p.m. and except for industrial areas and drill sites as shown on the oil well servicing map on file in City Hall where work shall be permitted on Saturdays and Sundays from nine a.m. to seven p.m.

B. During redrilling activities, soundproofing shall be provided in accordance with Section 16.16.110.

C.

1. During redrilling, reworking or servicing operations the operator shall be required to respond to resident complaints about noise from such operations. If the operator has not taken action to reduce the noise from such operations to a level acceptable to the complaining resident within twenty-four hours of the making of the complaint, the city may order the operator to implement one or more of the following temporary noise mitigating measures:

- a. Extension or diversion of oil service rig tailpipes away from affected dwellings.
- b. Replacement of defective or worn mufflers.
- c. Construction of sound barriers up to one hundred twenty square feet in dimension between any operating engine(s) and the affected dwelling, which barriers must comply with all Uniform Fire Code provisions then in effect.

- 9.16.087 – Existing oil field equipment violations and compliance procedures.

B.

1. Should the noise measurement indicate noise levels exceeding the noise levels set forth in Section 9.16.020(B), the city shall notify the operator. The notice shall state the time and date of the city's measurement, the noise level measured, and shall state that the operator must take corrective actions to remedy the violation. The corrective actions may include, but are not limited to, the following:

- a. Repairs to the oil field equipment motor, belts, transmission, etc.;
- b. Construction of an enclosure over the belt, motor, and/or pulleys of sufficient design and quality to mitigate noise to the greatest extent possible;
- c. Construction of a wall between the offending oil field equipment and the dwelling of sufficient height and density to mitigate noise to the greatest extent possible;
- d. Replacement or repair of old aboveground pumping units to achieve noise levels similar to comparable equipment in good working order.

– Title 16 – Oil and Gas Code, Chapter 16.16, Drilling Standards

- 16.16.030 – Setbacks and minimum drill site dimensions.

B. No well shall be drilled where the center of the well bore, at ground surface, will be less than the following prescribed distances:

1. Fifty feet to any adjacent interior property line not part of an oil and gas surface leasehold;
2. One hundred feet from a non-oil-related building for human occupancy;
3. One hundred feet from existing tanks, tank farms, or tank batteries used for storage of flammable materials;
4. Seventy-five feet from any public right-of-way shown on the city's official plan lines map, general plan, or any specific plan;
5. Three hundred feet from any place of public assemblage, institution, hospital, or school;
6. Two hundred feet from any public park.

- 16.16.110 – Soundproofing.

A. If drilling or redrilling operations are located within six hundred feet of an occupied building, noise sources associated with the operation shall be enclosed with soundproofing sufficient to ensure that expected noise levels do not exceed the noise limits contained in Chapter 9.16 of this code. Such soundproofing shall be installed prior to commencement of operations and may include but shall not be limited to the following:

1. Blanket covering for the first twelve feet above the working platform;
2. Blanket covering of all housing, including but not limited to, engines, pumps, and generators;
3. Additional blanket covering, including the top of rig, crown block, or at ground level when deemed necessary by the inspector.

- 16.16.130 – Noise control--General.

A. All drilling or redrilling operations shall conform to Chapter 9.16 of this code.

– Title 16 – Oil and Gas Code, Chapter 16.20, Operating and Safety Standards

- 16.20.100 – Noise control--General.

A. All operations shall conform to Chapter 9.16 of this code. If noise levels exceed the ambient noise levels permitted in Chapter 9.16, the inspector shall issue a notice to the operator.

- 16.20.110 – Vibration.

Vibration from equipment shall be kept to a minimum level, and in such cases as it is required, vibration dampening equipment of the best available technology shall be installed as required by the inspector so as to reduce vibration to a minimum.

3.11.2.5 City of Long Beach – General Plan

As discussed above, although the Project is located entirely within the City of Signal Hill, due to the location of the drill sites, certain nearby receptors are located within the City of Long Beach. Therefore, both the City of Signal Hill and City of Long Beach noise standards are utilized to determine the significance of noise impacts at certain receptors within this EIR.

The City of Long Beach – General Plan (City of Long Beach 1975), specifically the Noise Element adopted in 1975, contains detailed descriptions of existing noise sources within the Long Beach area, and provides broad community guidance and goals related to noise. The primary Long Beach General Plan noise standards are found within Table 11 (Recommended Criteria for Maximum Acceptable Noise Levels) of the General Plan. Specifically, Table 3.11-5 below summarizes maximum acceptable noise levels, dependent upon the noise receiver land use type.

Table 3.11-5: Long Beach General Plan – Recommended Criteria for Maximum Acceptable Noise¹

Major Land Use Type	Maximum Single Hourly Peak L _{max} (dBA)	Outdoor L ₁₀ ² (dBA)	Outdoor L ₅₀ ³ (dBA)	Indoor L _{dn} ⁴ (dBA)
Residential ⁵ (7 a.m. – 10 p.m.)	70	55	45	45
Residential ⁵ (10 p.m. – 7 a.m.)	60	45	35	35
Commercial (anytime)	75	65	55	--- ⁶
Industrial (anytime)	85	70	60	--- ⁶

Source: City of Long Beach 1975

Notes:

¹ Based on existing ambient level ranges in Long Beach and recommended U.S. Environmental Protection Agency ratios and standards for interference and annoyance.

² Noise levels exceed ten percent of the time.

³ Noise levels exceed fifty percent of the time.

⁴ Day-Night average sound level. The 24-hour A-weighted equivalent sound level with a 10-decibel penalty applied to nighttime levels.

⁵ Includes all residential categories and all noise sensitive land uses such as hospitals, schools, etc.

⁶ Since different types of commercial and industrial activities appear to be associated with different noise levels, identification of a maximum indoor level for activity interference is unfeasible.

3.11.2.6 City of Long Beach – Municipal Code

As described above, due to the location of the drill sites, some nearby receptors are located in the City of Long Beach. Therefore, the noise provisions of the City of Long Beach Municipal Code are included here to evaluate the potential impacts to these receptors. The City of Long Beach – Municipal Code (City of Long Beach, 2022), specifically Title 8 (Health and Safety) and

Title 12 (Long Beach Oil Code), were also reviewed and potentially applicable noise standards and requirements are summarized below. Also see Appendix C for relevant excerpts.

– Title 8 – Health and Safety, Chapter 8.80, Noise

- 8.80.150 – Exterior noise limits-Sound levels by receiving land use district.

B. No person shall operate or cause to be operated any source of sound at any location within the incorporated limits of the City or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured from any other property, either incorporated or unincorporated, to exceed:

1. The noise standard for that land use district as specified in Table A in Section 8.80.160 for a cumulative period of more than thirty minutes in any hour; or
2. The noise standard plus five (5) decibels for a cumulative period of more than fifteen minutes in any hour; or
3. The noise standard plus ten decibels for a cumulative period of more than five minutes in any hour; or
4. The noise standard plus fifteen decibels for a cumulative period of more than one minute in any hour; or
5. The noise standard plus twenty decibels or the maximum measured ambient, for any period of time.

C. If the measured ambient level exceeds that permissible within any of the first four noise limit categories in Subsection B of this Section, the allowable noise exposure standard shall be increased in five decibels increments in each category as appropriate to encompass or reflect the ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category in Subsection B of this Section, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

- 8.80.160 – Exterior noise limits-Correction for character of sound.

In the event that alleged offensive noise contains a steady audible tone such as a whine, screech, or hum, or is a repetitive noise such as hammering or riveting or contains music or speech conveying informational content, the standard limits set forth in Table A shall be reduced by five decibels.

Table A Exterior Noise Limits

Receiving Land Use District*	Time Period	Noise Level** (dBA)
District One	Night: 10:00 p.m.-7:00 a.m.	45
	Day: 7:00 a.m.-10:00 p.m.	50
District Two	Night: 10:00 p.m.-7:00 a.m.	55
	Day: 7:00 a.m.-10:00 p.m.	60
District Three	Any time	65
District Four	Any time	70
District Five	Regulated by other agencies and laws	

Source: City of Long Beach 1975

Notes:

* District One: Predominantly residential with other land use types also present

District Two: Predominantly commercial with other land use types also present

Districts Three and Four: Predominantly industrial with other land types use also present

District Five: Airport, freeways and waterways regulated by other agencies

** Districts Three and Four limits are intended primarily for use at their boundaries rather than for noise control within those districts.

- 8.80.170 – Interior noise limits-Maximum sound levels.

A. The interior noise standards for various land use districts as presented in Table C shall apply, unless otherwise specifically indicated, within structures located in designated zones with windows in their normal seasonal configuration.

Table C

Receiving Land Use District*	Type of Land Use	Time Interval	Noise Level** (dBA)
All	Residential	10:00 p.m.-7:00 a.m.	35
All	Residential	7:00 a.m.-10:00 p.m.	45
All	School	7:00 a.m.-10:00 p.m.	45
Hospital, designated quiet zones and noise sensitive zones		10:00 p.m.-7:00 a.m.	40

B. No person shall operate, or cause to be operated, any source of sound indoors at any location within the incorporated limits of the City or allow the creation of any indoor noise which causes the noise level when measured inside the receiving dwelling unit to exceed:

1. The noise standard for that land use district as specified in Table C for a cumulative period of more than five minutes in any hour; or

2. The noise standard plus five decibels (5 dB) for a cumulative period of more than one (1) minute in any hour; or
3. The noise standard plus ten decibels (10 dB) or the maximum measured ambient, for any period of time.

C. If the measured indoor ambient level exceeds that permissible within any of the first two noise limit categories in this Section, the allowable noise exposure standard shall be increased in five decibel (5 dB) increments in each category as appropriate to reflect the indoor ambient noise level. In the event the indoor ambient noise level exceeds the third noise limit category, the maximum allowable indoor noise level under said category shall be increased to reflect the maximum indoor ambient noise level.

- 8.80.190 – Noise disturbances-Prohibited.

No person shall unnecessarily make, continue or cause to be made or continued, any noise disturbance.

- 8.80.200 – Noise disturbances-Acts specified.

The following acts, and the causing or permitting thereof, are declared to be in violation of this Chapter:

G. Vibration. Operating or permitting the operation of any device that creates vibration which is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at one hundred fifty feet (forty-six meters) from the source if on a public space or public right-of-way. For the purposes of this subsection, "vibration perception threshold" means the minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such directed means as, but not limited to, sensation by touch or visual observation of moving objects. The perception threshold shall be presumed to be .001 "g's" in the frequency range 0-30 hertz and .003 "g's" in the frequency range between 30 and 100 hertz;

- 8.80.260 – Exemption-Oil and gas wells.

The provisions of this Chapter shall not apply to:

A. Normal well servicing, remedial or maintenance work performed within an existing well which does not involve drilling or re-drilling and which is restricted to the hours between seven a.m. and seven p.m., exclusive of weekends and holidays, in residential areas;

B. Any drilling or re-drilling work which is done in full compliance with Subsection 8.80.040.E and Sections 8.80.060 through 8.80.120, and with the soundproofing and all other requirements of Section 12.32.030.

- Title 12 – Long Beach Oil Code, Chapter 12.32, Noise

- 12.32.020 – Areas 5, 6, 7A, 7B, 8, 9, 12, 13, 16, 18, 19, 21, 22, 23 and 24.

A. No person, either as owner, agent, or operator, shall conduct any drilling, or redrilling operation at any well located within oil operating areas 5, 6, 7A, 7B, 8, 9, 12, 13, 16, 18, 19, 21, 22, 23 and/or 24 in any manner so as to create any noise which causes the exterior noise level when measured at the property line of any single- or multiple-family dwelling unit, guest room, commercial building, school, hospital, church, or public library to exceed the noise level standards set forth in Table 1. The exterior noise level generated by the drilling or redrilling operation shall be continuously monitored to ensure conformance to the noise level standards. The costs of such monitoring shall be borne by the operator conducting such operation.

Table 1 Exterior Noise Level*

Cumulative Number of Minutes in any One-hour Timer Period	Noise Level Daytime 7:30 a.m. to 9:30 p.m.	Standards, dBA Nighttime 9:30 p.m. to 7:30 a.m.
30	50	45
15	55	50
5	60	55
1	65	60
0	70	65

Source: City of Long Beach 1975

Notes: * In accordance with Chapter 8.80 - Noise

No person, either as owner, agent, or operator, shall conduct any drilling or redrilling operation at any time at any well located in oil operating areas 5, 6, 7A, 7B, 8, 9, 12, 13, 16, 18, 19, 21, 22, 23 and/or 24 in any manner so as to create any noise which causes the interior noise level in excess of those limits provided in Chapter 8.80.

1. If the measured ambient level exceeds that permissible within any of the first four (4) noise limit categories in Table 1 above, the allowable noise exposure standard shall be increased in five decibel increments in each affected category as appropriate to encompass or reflect the ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to equal the maximum ambient noise level.

3.11.3 Impact Assessment

The Initial Study for the Project determined that the Project would have less than significant impacts with regard to development within an airport land use plan. This impact is not discussed further in this EIR.

NOI (a). Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than Significant with Mitigation Incorporated. To address the CEQA Guidelines Appendix G, Noise Threshold Criteria (a), the applicable City of Signal Hill General Plan and Municipal Code standards are utilized. Additionally, for those noise receptors located within the City of Long Beach (i.e., Receptors R1, R7, R19 and R20), applicable Long Beach standards are also utilized. Lastly, a +3 dBA or greater increase in noise levels at nearby receptors due to onsite Project noise sources would also be considered a potentially significant impact.

Noise sensitive areas typically include residential areas, schools, convalescent hospitals, acute care facilities, and park and recreational areas. The drill sites are in a highly urbanized area characterized by a wide variety of land uses with numerous sensitive receptors located within and in the vicinity of several drill sites as summarized in Table 3.11-1 above. The following summarizes the nearest residential sensitive receptors to each site:

- Drill Site #1 – Residences approximately 860 feet to the west,
- Drill Site #2 – Residences approximately 1,350 feet to the northwest,
- Drill Site #3 – Residences approximately 680 feet to the southwest,
- Drill Site #4 – Residences approximately 500 feet to the northeast,
- Drill Site #5 – Residences approximately 25 feet to the west,
- Drill Site #6 – Residences approximately 92 feet to the north, and
- Drill Site #7 – Residences approximately 310 feet to the north.

As summarized in Section 2, the Project is primarily the continuance of SHP's existing consolidated oil and gas operations at the seven drill sites covered under CUP 97-03 for the proposed 20-year term. Accordingly, the impact analysis quantifies these effects of continuing operations using baseline conditions as representative of continuing operations, as well as quantifying the potential impacts at nearby receptors because of new drilling/redrilling activity during the proposed 20-year term of the Project. The existing and ongoing oil and gas operations that would be considered the continuing operations portion of the Project (e.g., oil/gas extraction, tanks/conveyances, off-road equipment, on-road vehicles, routine maintenance/servicing, ancillary operations, natural gas processing and the power turbine at Drill Site #2, etc.) were characterized as the ambient noise levels (see Table 3.10-2), as all seven drill sites were fully active and operational while the measurements were being collected. Ongoing operation of the existing facilities would continue to comply with the mandatory requirements of the applicable noise ordinance of the Signal Hill Municipal Code. With compliance with the applicable Signal Hill Municipal Code noise ordinance, the ongoing

operation of the existing facilities would have a less than significant impact relative to this impact criteria.

With respect to new project activities, the following sections summarize the methodologies, assumptions and reference noise levels utilized in the analyses of each Project activity with the potential to generate noise at nearby sensitive receptors, specifically the following: 1) Gas System Modification – Construction; 2) Gas System Modification – Operations; 3) Drilling (new wells); and 4) Redrilling (existing wells). In addition, the estimated noise levels resulting from new project activities are presented below. The predicted noise level change experienced at each receptor/property line as result of the Project is quantified and compared to the applicable thresholds to determine the potential significance of Project impacts. Where Project noise levels exceed applicable thresholds, feasible mitigation measures are proposed.

Natural Gas Processing Facility Modification – Construction

To determine noise impacts during construction of the proposed natural gas processing system modifications at Drill Site #2, various noise reference data was utilized. Per information provided by SHP, mobile equipment (e.g., backhoe, crane, etc.) and other smaller tools (e.g., concrete saw, welder/torch, drum mixer, etc.) would operate onsite to prepare the surface foundations, install/anchor the new equipment (e.g., compressor, LTS unit, CO₂ unit, burner, etc.), and conduct ancillary construction activities as needed. The natural gas modifications would be installed within the northwestern portion of Drill Site #2, adjacent to the existing natural gas/vapor recovery systems.

To determine maximum noise impacts during construction of the gas system modifications, it is assumed that the construction equipment summarized in Table 3.11-6 would operate simultaneously at-grade in the onsite construction area closest to the nearest SHP property line and/or each affected receptor. Note that due to large existing structures found at Drill Site #2, specifically the onsite field office/power turbine infrastructure located immediately north of the proposed gas system modification area, as well as the block walls that surrounds Drill Site #2, line-of-sight would either be partially or fully blocked between onsite construction activities and offsite receivers. Therefore, some shielding and noise attenuation due to these intervening structures was accounted for in the impact calculations (Sespe 2022b).

Table 3.11-6 shows the type and quantity of equipment estimated to be utilized at Drill Site #2 during construction of the gas system modifications. Usage fraction (%) and maximum sound pressure level (L_{max}) noise data shown for mobile sources are FHWA default values.

Table 3.11-6: Gas System Modifications – Construction Equipment Noise References

Equipment Noise Source	L _{max} @ 50-feet (dBA)	Usage (%)	L _{eq} @ 50-feet (dBA)
Backhoe	80	40%	76
Concrete Saw	90	20%	83
Crane	85	16%	77
Drum Mixer	80	50%	77
Welder / Torch	73	40%	69

Source: FHWA 2006

Per information provided by SHP, and in accordance with Section 9.16.050 of the City’s Municipal Code (see Section 3.13.2.5), construction of the proposed gas system modifications would be limited to Monday through Friday, between the hours of 7:00 a.m. and 6:00 p.m. Because certain City criteria applies to noise effects over a 24-hour period (e.g., CNEL noise levels), it was assumed that the construction equipment summarized in Table 3.10-6 would operate simultaneously for up to 11-hours in a given day, at-grade, in the applicable construction area in closest proximity to nearest Project property boundary/sensitive receptor.

Table 3.11-7 below shows the estimated daytime (7:00 a.m. – 10:00 p.m.) average (L_{eq}), as well as the 24-hour CNEL noise levels experienced at nearby receptors due to construction equipment operating at Drill Site #2. Note that only receptors within the vicinity of Drill Site #2 are considered in the analysis below (i.e., Receptors R5, R6 and R7). To determine maximum noise impacts, it was assumed that the construction equipment summarized in Table 3.10-6 would operate simultaneously at-grade in the onsite location closest to each affected receptor (Sespe 2022b). Note that minimal shielding and noise attenuation due to distance and intervening structures/topography structures (e.g., field office, power turbine infrastructure, block walls, etc.) was accounted for in the impact calculations (Sespe 2022b). In addition to the noise thresholds established by the City, a +3 decibel increase above the ambient is generally accepted as the minimum perceptible change in noise resulting from a source. Furthermore, the Draft EIR prepared for City of Signal Hill Housing Element of the General Plan utilized a “noise levels increased by more than 3 dBA” threshold for operational noise sources (City of Signal Hill 2021). Therefore, if the Project equipment sources are found to generate noise levels at nearby receptors in excess of +3 decibels or more above the measured ambient noise levels, then a potentially significant impact would result.

Table 3.11-7: Gas System Modifications – Predicted Construction (Temporary^a) Noise Levels at Receptors (L_{eq} dBA)^a

Time Period	Receptor	Receptor Type	Baseline ^b	Equipment Source	Total Project	Increase due to Project ^c	Potentially Significant?
Daytime	R5	Commercial	66.7	63.4	68.4	+1.7	No
Daytime	R6	Commercial	66.7	62.0	68.0	+1.3	No

Time Period	Receptor	Receptor Type	Baseline ^b	Equipment Source	Total Project	Increase due to Project ^c	Potentially Significant?
Daytime	R7	Industrial	66.7	60.2	67.6	+0.9	No
Nighttime	R5	Commercial	66.3	---	66.3	0.0	No
Nighttime	R6	Commercial	66.3	---	66.3	0.0	No
Nighttime	R7	Industrial	66.3	---	66.3	0.0	No

Source: Sespe 2022b

Notes:

- a. Note that construction activities would occur during daytime hours only (7:00 a.m. and 6:00 p.m.). Therefore, there would be no nighttime activities (10:00 p.m. to 7:00 a.m.) and/or noise levels.
- b. Baseline noise levels represent the actual measured noise levels within the vicinity of Drill Site #2 (see Table 3.10-2).
- c. A potentially significant impact would result of the Project were to generate noise that exceeds the existing measured ambient noise levels by +3 decibels or more.

As shown in Table 3.11-7, the estimated Project noise levels resulting from the construction of the natural gas system modifications would not exceed the applicable City of Signal Hill noise standard at any receptors located within the vicinity of Drill Site #2. Noise level increases experienced at nearby receptors due to onsite construction ranged from +0.5 dBA to +1.7 dBA above existing ambient levels, which is below the applicable +3 decibel threshold. Therefore, construction noise impacts are considered less than significant, with no noise controls or mitigations required.

Natural Gas Processing Facility Modification – Operation

Once construction of the natural gas processing system modifications at Drill Site #2 are complete, the equipment would be placed into full operation. As discussed in Section 2, the following new components would operate: (i) a sales gas booster compressor; (ii) a redundant LTS unit; (iii) a redundant CO₂ capture and sequestration unit (“CO₂ unit”); and, (iv) a Cimarron certified ultra-low emissions “CEB 800” burner. The new units would be sized for handling 2,000 million standard cubic feet per day of natural gas each and would be installed contiguous to the existing equipment. As with SHP’s existing natural gas plant at CUP Site #2, the new units would operate continuously, 24-hours per day, except during intermittent periods of maintenance or repairs.

Per information provided by SHP, Table 3.11-8 summarizes approximated noise-generating components that would operate continuously 24-hours per day at Drill Site #2 as part of the modified natural gas processing system. As with the construction impact analysis, it was assumed the plant components would operate simultaneously at-grade, in the onsite location closest to each affected SHP property line/sensitive receptor. Additionally, some noise attenuation was assumed due to shielding provided by the large power turbine building and the existing block walls which surround Drill Site #2, as these existing structures would partially or complete shield onsite equipment noise sources (Sespe 2022b).

Table 3.11-8: Gas System Modifications – Operational (Long-Term) Component Noise References

Equipment Noise Source	L _{max} @ 50-feet (dBA)	Usage (%)	L _{eq} @ 50-feet (dBA)
Compressor (air)	80	40%	76
Generator	82	50%	79
Pumps	77	50%	74
Ventilation Fan	85	100%	75

Source: Sespe 2022b

Table 3.11-9 below shows the estimated daytime (7:00 a.m. – 10:00 p.m.) and nighttime (10:00 p.m. – 7:00 a.m.) average (L_{eq}) noise levels experienced at nearby receptors due to the modified gas system equipment operating at Drill Site #2. Note that only receptors within the vicinity of Drill Site #2 are considered below (i.e., Receptors R5, R6 and R7). Additionally, appropriate noise attenuation due to existing perimeter block walls and the three-story power plant building was also incorporated at Receptors R5 and R7 (Sespe 2022b).

Table 3.11-9: Gas System Modifications – Predicted Operational Noise Levels at Receptors (L_{eq} dBA)

Time Period	Receptor	Receptor Type	Baseline ^a	Equipment Source	Total Project	Increase due to Project ^b	Potentially Significant?
Daytime	R5	Commercial	66.7	60.5	67.6	+0.9	No
Daytime	R6	Commercial	66.7	59.0	67.4	+0.7	No
Daytime	R7	Industrial	66.7	57.2	67.2	+0.5	No
Nighttime	R5	Commercial	66.3	60.5	67.3	+1.0	No
Nighttime	R6	Commercial	66.3	59.0	67.0	+0.7	No
Nighttime	R7	Industrial	66.3	57.2	66.8	+0.5	No

Source: Sespe 2022b

Notes:

- a. Baseline noise levels represent the actual measured noise levels within the vicinity of CUP Site #2 (see Table 3.10-2).
- b. A potentially significant impact would result if the Project were to generate noise that exceeds the existing measured ambient noise levels by +3 decibels or more.

As shown in Table 3.11-9, the estimated Project noise levels resulting from the 24-hour operations of the natural gas system modifications would not generate appreciable noise levels at nearby receptors. Equipment noise level increases at nearby receptors ranged from a +0.5 dBA to +1.0 dBA, well below the applicable +3 dBA threshold. Note that because none of the receptors located within the vicinity of Drill Site #2 are noise-sensitive land uses (i.e., residences), the Signal Hill’s General Plan CNEL for exterior noise levels for commercial receptors is not applicable.

While operational noise levels experienced at nearby sensitive receptors would be less than significant, the City of Signal Hill and SHP’s existing CUP 97-03 also require that noise generated

by the gas processing plant not exceed 70 decibels when evaluated at the Drill Site #2 property boundaries as well (per Signal Hill Municipal Code Section 9.16.020). As shown in Table 3.11-10, the Project noise levels resulting from the 24-hour operations of the natural gas system modifications are estimated to exceed 70 dBA at the closest western property boundary by approximately +1.0 decibels. While a +1.0 dBA change in noise is generally below the threshold of human perception (Bolt Beranek and Neuman, Inc. 1973), nonetheless **MM NOISE-1** is recommended to ensure Project’s operational gas system noise would be less than significant.

Table 3.11-10: Gas System Modifications – Predicted Operational Noise Levels at Property Boundaries (Leq dBA)

Property Boundary	Distance – Source to Property Boundary	Equipment Noise Level @ Property Boundary (dBA)	Applicable Threshold (dBA)	Level of Exceedance (dBA)	Potentially Significant?
North	165-feet	64.1	70	0.0	No
South	375-feet	62.0	70	0.0	No
East	425-feet	63.9	70	0.0	No
West	105-feet	71.0	70	+1.0	Yes

Source: Sespe 2022b

Values shown in **bold** represent a potentially significant impact.

Drilling (New Wells) & Redrilling (Existing Wells)

SHP uses two company-owned drilling rigs for their drilling/redrilling operations, depending on the depth to be drilled. The lighter-duty drilling rig is SHP’s Drill Rig #5. The majority of Drill Rig #5 components are electrically powered, with the exception of the drawworks and mast which are powered by a portable diesel-powered engine. SHP’s larger, heavier-duty Drill Rig #6 is fully electrically powered (i.e., no engines or generators used during drilling/redrilling operations).

To quantify noise generated by SHP’s ongoing drilling/redrilling operations at the drill sites, average and maximum noise levels resulting from drilling and redrilling activities presented in the City’s General Plan – Noise Element (City 2009) were utilized. As presented in the General Plan, the City performed noise testing during drilling operations conducted at a well in the parking lot of the Costco/The Home Depot center located at the southeast corner of Cherry Avenue and Willow Street (close to Drill Site #4). Measurements were collected along the fence of the derrick enclosure, in an open area, with no buildings or topographical changes that could affect the measured noise levels. Per the City’s General Plan, Table 3.10-11 presents the noise levels measured within the vicinity of the drilling operations, at various distance intervals. Note that the General Plan measurements not only capture noise resulting from drill rig operations, but also capture ancillary activities occurring within the vicinity, including generators, mud pumps, and other equipment (i.e., equipment and personnel moving throughout the derrick enclosure). Additionally, the General Plan measurements were heavily influenced by noise coming from “generator trailers”. As discussed above, the analysis assumes uses the electric drill rig for 90% of drilling/redrilling activities and does not require the significant use of

generators, other than intermittently for the drawworks when operating Drill Rig #5. Therefore, the noise levels presented in Table 3.11-11 account for the estimated total noise resulting from SHP’s ongoing drilling/redrilling operations.

Table 3.11-11: Drilling/Redrilling Reference Noise Level(s)

Measurement Distance (feet)	Measured Average (L_{eq})	Measured Maximum (L_{max})
120	65	75
120	62	70
80	65	76
60	68	86
80	76	78
120	76	81
120	75	78
80	73	82
60	73	77
80	69	79

Source: City 2009

To simplify the Project impact calculations, the General Plan noise levels summarized in Table 3.11-11 were normalized to a reference distance of 50-feet. Specifically, it is estimated that receptors at a reference distance of 50-feet would experience an average (L_{eq}) noise level of 78.2 dBA, and maximum noise level of 84.5 dBA during drilling/redrilling operations (Sespe 2022b). Drilling of new wells and redrilling of existing wells generally requires continuous 24-hour drill rig operations in a given day. Therefore, to determine worst-case noise impacts, it was assumed that the drill rig (both Drill Rig #5 or #6) would operate continuously for 24-hours a day at each drill site during both onsite drilling and redrilling activities. Lastly, while most drilling/redrilling would continue to occur within the existing well cellars at each drill site, there is a potential that SHP could construct new well cellars in other onsite locations within the existing drill sites boundaries to allow for the construction of new oil production and/or water injection wells. Therefore, conservatively it was assumed that drilling/redrilling could occur anywhere within the drill sites boundaries, other than areas with significant existing infrastructure (i.e., tanks, piping, buildings/structures, etc.) that would preclude the construction of new well cellars. Additionally, the required minimum drilling setbacks outlined in Section 16.16.030 of the Municipal Code were also accounted for (Sespe 2022b)

Redrilling/Drilling Noise Impacts: SHP would continue to redrill existing oil production and water injection wells at all seven of the drill sites on an as needed basis. As discussed previously, while most redrilling would continue to occur within the existing well cellars, there is a potential that SHP could construct new well cellars in other onsite locations within the existing drill sites boundaries, where future redrilling could also occur. Therefore,

conservatively it was assumed that redrilling could occur in the onsite locations closest to each affected receptor (Sespe 2022b).

SHP would also continue to drill new oil production and water injection wells at all seven of the drill sites on an as needed basis. Drilling of new wells would involve identical equipment as described previously for redrilling, therefore the same assumptions described above related to the equipment utilized, the location of proposed activities, the attenuation provided by acoustical barriers and existing perimeter walls, etc., would remain applicable.

Based upon these operating parameters and assumptions, Table 3.11-13 shows the estimated Project noise levels at affected receptors resulting from redrilling and drilling operations at each of the drill sites. As shown, estimated worst-case, unmitigated noise levels would potentially exceed certain City of Signal Hill and City of Long Beach noise standards if drilling was to occur within close proximity to Receptors R16, R19, R21 and R22. Specifically, if any new wells were drilled or existing wells redrilled in the northern portion of CUP Site #5, adjacent to Combella Drive, estimated noise levels at Receptor R16 would potentially exceed the applicable CNEL and average (L_{eq}) noise standards (Sespe 2022b). Additionally, if a new well were drilled or existing well redrilled within the western/northern portions of CUP Site #6 or in the eastern portion of Drill Site #7, applicable Signal Hill/Long Beach 24-hour CNEL, and nighttime average (L_{eq}) noise levels would be potentially significant at Receptors R19, R21 and R22. Therefore, unmitigated drill noise impacts are considered *potentially significant*.

Table 3.11-13: Redrilling/Drilling – Predicted Noise Levels at Receptors (CNEL and L_{eq} dBA)^a

Time Period	Drill Site	Receptor	Receptor Type	Baseline ^a	Equipment Source	Total Project	Increase due to Project ^b	Potentially Significant?
CNEL	#1	R1	Residence	73.7	47.2	73.7	0.0	No
		R2	Commercial	73.7	61.7	74.0	+0.3	No
		R3	Commercial	73.7	63.0	74.1	+0.4	No
		R4	Commercial	73.7	61.7	74.0	+0.3	No
	#2	R5	Commercial	73.0	54.8	73.1	+0.1	No
		R6	Commercial	73.0	58.1	73.1	+0.1	No
		R7	Industrial	73.0	55.1	73.1	+0.1	No
	#3	R8	Residence	63.7	52.9	64.1	+0.3	No
		R9	Commercial	63.7	49.7	63.9	+0.2	No
		R10	Commercial	63.7	55.9	64.4	+0.7	No
		R11	Commercial	63.7	60.3	65.4	+1.6	No
		R12	Industrial	63.7	63.2	66.5	+2.7	No
	#4	R13	Residence	69.5	55.0	69.6	+0.2	No
		R14	Commercial	69.5	67.6	71.6	+2.2	No

Time Period	Drill Site	Receptor	Receptor Type	Baseline ^a	Equipment Source	Total Project	Increase due to Project ^b	Potentially Significant?
		R15	Commercial	69.5	65.0	70.8	+1.3	No
	#5	R16	Residence	62.3	65.2	67.0	+4.7	Yes
		R17	Residence	62.3	58.9	63.9	+1.6	No
		R18	Residence	62.3	55.4	63.1	+0.8	No
	#6	R19	Residence	61.7	65.4	66.9	+5.2	Yes
		R20	Residence	61.7	55.7	62.7	+1.0	No
		R21	Commercial	61.7	67.2	68.3	+6.6	Yes
	#7	R22	Commercial	63.5	64.4	67.0	+3.5	Yes
Daytime 7 a.m. – 10 p.m.	#1	R1	Residence	74.4	40.5	74.4	0.0	No
		R2	Commercial	74.4	55.1	74.4	+0.1	No
		R3	Commercial	74.4	56.4	74.4	+0.1	No
		R4	Commercial	74.4	55.1	74.4	+0.1	No
	#2	R5	Commercial	66.7	48.1	66.8	+0.1	No
		R6	Commercial	66.7	51.5	66.9	+0.1	No
		R7	Industrial	66.7	48.5	66.8	+0.1	No
	#3	R8	Residence	58.5	46.2	58.7	+0.2	No
		R9	Commercial	58.5	43.1	58.6	+0.1	No
		R10	Commercial	58.5	49.3	59.0	+0.5	No
		R11	Commercial	58.5	53.6	59.7	+1.2	No
		R12	Industrial	58.5	56.5	60.6	+2.1	No
	#4	R13	Residence	69.3	48.4	69.3	0.0	No
		R14	Commercial	69.3	60.9	69.9	+0.6	No
		R15	Commercial	69.3	58.3	69.6	+0.3	No
	#5	R16	Residence	57.8	58.6	61.2	+3.4	Yes
		R17	Residence	57.8	52.2	58.9	+1.1	No
		R18	Residence	57.8	48.8	58.4	+0.5	No
	#6	R19	Residence	59.8	58.7	62.3	+2.5	No
		R20	Residence	59.8	49.0	60.2	+0.3	No
		R21	Commercial	59.8	60.6	63.2	+3.4	Yes
	#7	R22	Commercial	57.8	57.8	60.8	+3.0	Yes
Nighttime 10 p.m. – 7 a.m.	#1	R1	Residence	61.9	40.5	62.0	0.1	No
		R2	Commercial	61.9	55.1	62.7	+0.8	No

Time Period	Drill Site	Receptor	Receptor Type	Baseline ^a	Equipment Source	Total Project	Increase due to Project ^b	Potentially Significant?
		R3	Commercial	61.9	56.4	63.0	+1.1	No
		R4	Commercial	61.9	55.1	62.7	+0.8	No
	#2	R5	Commercial	66.3	48.1	66.4	+0.1	No
		R6	Commercial	66.3	51.5	66.4	+0.1	No
		R7	Industrial	66.3	48.5	66.4	+0.1	No
	#3	R8	Residence	56.8	46.2	57.1	+0.4	No
		R9	Commercial	56.8	43.1	56.9	+0.2	No
		R10	Commercial	56.8	49.3	57.5	+0.7	No
		R11	Commercial	56.8	53.6	58.5	+1.7	No
		R12	Industrial	56.8	56.5	59.6	+2.9	No
	#4	R13	Residence	59.5	48.4	59.8	+0.3	No
		R14	Commercial	59.5	60.9	63.3	+3.8	No
		R15	Commercial	59.5	58.3	62.0	+2.5	No
	#5	R16	Residence	55.1	58.6	60.2	+5.1	Yes
		R17	Residence	55.1	52.2	56.9	+1.8	No
		R18	Residence	55.1	48.8	56.0	+0.9	No
	#6	R19	Residence	52.5	58.7	59.6	+7.2	Yes
		R20	Residence	52.5	49.0	54.1	+1.6	No
		R21	Commercial	52.5	60.6	61.2	+8.7	Yes
	#7	R22	Commercial	56.8	57.8	60.3	+3.5	Yes
	24-Hour	#1	R1	Residence	72.4	40.5	72.4	0.0
R2			Commercial	72.4	55.1	72.5	+0.1	No
R3			Commercial	72.4	56.4	72.5	+0.1	No
R4			Commercial	72.4	55.1	72.5	+0.1	No
#2		R5	Commercial	66.5	48.1	66.6	+0.1	No
		R6	Commercial	66.5	51.5	66.7	+0.1	No
		R7	Industrial	66.5	48.5	66.6	+0.1	No
#3		R8	Residence	57.9	46.2	58.2	+0.3	No
		R9	Commercial	57.9	43.1	58.0	+0.1	No
		R10	Commercial	57.9	49.3	58.5	+0.6	No
		R11	Commercial	57.9	53.6	59.3	+1.4	No
		R12	Industrial	57.9	56.5	60.3	+2.4	No

Time Period	Drill Site	Receptor	Receptor Type	Baseline ^a	Equipment Source	Total Project	Increase due to Project ^b	Potentially Significant?
	#4	R13	Residence	67.5	48.4	67.6	+0.1	No
		R14	Commercial	67.5	60.9	68.4	+0.9	No
		R15	Commercial	67.5	58.3	68.0	+0.5	No
	#5	R16	Residence	57.0	58.6	60.9	+3.8	Yes
		R17	Residence	57.0	52.2	58.3	+1.2	No
		R18	Residence	57.0	48.8	57.6	+0.6	No
	#6	R19	Residence	58.2	58.7	61.5	+3.3	Yes
		R20	Residence	58.2	49.0	58.7	+0.5	No
		R21	Commercial	58.2	60.6	62.5	+4.3	Yes
	#7	R22	Commercial	57.5	57.8	60.6	+3.1	Yes

Source: Sespe 2022b

Values in **bold** represent a potentially significant impact.

Notes:

a. Baseline noise levels represent the actual measured noise levels within the vicinity of each Cdrill site/receptor (see Table 3.10-2).

b. A potentially significant impact would result of the Project were to generate noise that exceeds the existing measured ambient noise levels by +3 decibels or more.

Note that although estimated redrilling/drilling noise levels at Receptor R14 were found to be slightly elevated (i.e., estimated to generate noise levels approximately +3.8 dBA above the existing measured ambient noise levels), R14 represents that backside of a commercial receptor, not a defined sensitive receptor such as residence, school, daycare center, or nursing home. As such, store employees would only occupy this area intermittently and temporarily, and Project noise would not be audible to shoppers inside the structure (i.e., The Home Depot). Furthermore, it's presumed the store would be closed/unoccupied for the majority of the nighttime hours. For these reasons, even though estimate nighttime noise levels slightly exceed the +3 threshold at Receptor R14, noise levels resulting from drilling within Drill Site #4 are considered less than significant, with no additional mitigation measures required.

As shown in Table 3.11-13, noise resulting from the drilling/redrilling activities would be potentially significant at Drill Sites #5, #6 and #7, specifically within the vicinity of Receptors R16, R19, R21 and R22. All Project activities would be required to comply with the mandatory requirements of the applicable noise ordinance of the Signal Hill Municipal Code. In addition, if any drilling or redrilling would occur within 600 feet of an occupied building, then Section 16.16.110 of the Signal Hill Municipal Code would require soundproofing sufficient to ensure that expected noise levels do not exceed the noise limits contained in Chapter 9.16 of Signal Hill Municipal Code. SHP current operations comply with this section of the municipal code and SHP regularly uses sound barrier walls when conducting any redrilling operations at the drill sites.

The City has not received any noise complaints regarding the drill sites for any activities with the use of the temporary sound barrier walls. In addition, implementation of **MM NOISE-2** and **MM NOISE-3** would ensure that impacts would be reduced to less than significant. With compliance with the applicable Signal Hill Municipal Code noise ordinance and implementation of **MM NOISE 2** and **MM NOISE-3**, the proposed Project would have a less than significant impact relative to this impact criteria.

Well Cellar Construction

As discussed in Section 2, while SHP would primarily continue drilling/redrilling operations within the existing well cellars at each drill site, at times a new ancillary well cellar may need to be created. At most, a single backhoe would have to operate at the given CUP Site for no more than four hours to excavate the necessary well cellar depression. The estimated noise levels associated with operation of a backhoe at 50 feet from the source is approximately 76 dBA, with noise levels decreasing with distance from the source (dependent on topography and noise barriers between noise source and receptors). Additionally, well cellar construction would occur during daytime hours only (7:00 a.m. and 6:00 p.m.), Monday through Friday, consistent with Section 9.16.050 of the City's Municipal Code. Due to the short duration and low equipment activity levels associated with well cellar construction (i.e., use of a backhoe for less than four hours over a one-day construction period), and the fact that well cellar construction would occur during daytime hours only, noise and vibration impacts are expected to be de minimis when compared to louder drilling/redrilling operations. As such, noise effects associated with well cellar construction have been excluded from this noise impact analysis.

Mitigation Measures

MM NOISE-1: Following installation of the gas system modification system at Drill Site #2, equipment noise levels shall be verified through onsite noise measurements along the western property boundary. If actual measured noise levels exceed 70 dBA when measured at this location or exceed the ambient noise levels measured in April 2022 (see Table 3.10-2 above) by more than 3 dBA, additional noise control measures (e.g., sound barrier wall, noise curtain) shall be implemented until the measured noise levels no longer exceed the applicable standards.

MM NOISE-2: To ensure that drill rig noise levels at Drill Sites #5, #6 and #7 do not exceed the applicable standards published by the City of Signal Hill or the City of Long Beach, SHP shall implement one or more of the control measures noted below within the following proximities to receptors:

- Prohibit drilling/redrilling within the following areas at Drill Sites #5, #6 and #7:
 - Within 210-feet of the residences (i.e., Receptor 16) located north of Drill Site #5 across Combella Drive.

- Within 270-feet of the residential neighborhoods (i.e., Receptors R20 and R21) located north of Drill Site #6, across 20th Street.
 - Within 150-feet of the commercial building (i.e., Receptor R22) located immediately east of Drill Site #7.
- If onsite drilling/redrilling operations occur within the above-listed areas at Drill Sites #5, #6 and #7 noted above, SHP shall implement one or more of the following additional measures:
- Curtail drill rig operations during the evening and nighttime hours (i.e., 7:00 p.m. to 7:00 a.m.).
 - Install additional temporary sound barriers (e.g., curtains, shoots, etc.) affixed to the noisiest components of the drill rig, when occurring within the setback areas noted above. Temporary barriers should have a minimum Sound Transmission Class (STC) rating of 25 (STC-25) and should be of sufficient length/height to block line-of-sight between the equipment source (e.g., engines, generators, etc.) and the affected receptor. If needed, temporary barriers may be installed in multiple layers to ensure noise is sufficiently attenuated.
 - Construct new permanent barriers (e.g., concrete block walls, concrete paneling, etc.) along the drill site perimeters adjacent to the affected receptor(s). Perimeter walls should be installed prior to commencing evening and nighttime drilling/redrilling operations and should be constructed of sufficient length/height to block line-of-sight between the drill rig and the receptor.

MM NOISE-3: Following implementation of MM NOISE-2 during drilling/redrilling operations at Drill Sites #5, #6 and #7, the effectiveness of the control measures shall be verified through onsite noise measurements upon commencement of drill rig operations. In the event that actual measured noise levels exceed the applicable numeric standards and/or conflict with the assumptions contained within this analysis, additional noise control measures shall be implemented until the measured noise levels no longer exceed the applicable standards published by the City of Signal Hill or the City of Long Beach.

Residual Impacts

SHP would continue to comply with applicable provisions of the Signal Hill Municipal Code related to noise, including but not limited to responding quickly to neighbor complaints and City inspections, curtailing certain operations during nighttime hours, upgrading equipment exhaust mufflers, as well as conducting subsequently focused noise studies and deploying additional acoustical barriers/sound walls as needed throughout the life of the Project.

Incorporation of **MM NOISE-1** would ensure that appropriate protocols and measures are in-place to reduce potential impacts from the operation of the gas modification system at Drill Site #2 to a less than significant level.

Referring to the noise propagation calculations presented in Table 3.10-13, by ensuring that new well drilling and re-drilling at Drill Sites #5, #6 and #7 occurs at a minimum distance from nearby residential and commercial receptors, noise levels would be sufficiently attenuated as they are reduced by -3 decibels with each added doubling of distance between the noise source and receivers of concern. As noted in the analysis above, the City has observed that SHP's use of temporary sound barrier walls has been effective in preventing noise impacts and the City has not received any noise complaints since SHP began use of the barriers in accordance with the municipal code. Therefore, in accordance with **MM NOISE-2**, so long as SHP does not drill any new wells or re-drill existing wells within 210-feet of the apartment complex(s) located north of Drill Site #5 across Combella Drive, within 270-feet of the residential neighborhoods located north of Drill Site #6 across 20th Street, or within 150-feet of the commercial building located immediately east of Drill Site #7, Project noise resulting from drilling and re-drilling operations would be below the applicable noise thresholds acceptable at all affected receptors (Sespe 2022b). However, if drilling or re-drilling is conducted within these designated areas, then **MM NOISE-2** (or some combination of the measures found therein) and **MM NOISE-3** shall be implemented.

In addition, temporary acoustical blankets have been estimated to provide approximately -9 decibels of attenuation (further reductions can be realized if blankets are installed in multiple layers), while perimeter barriers are estimated to provide decibel reductions ranging from -3 to -9 decibels (depending on the length/height of the barrier) (Sespe 2022b). Therefore, with additional temporary noise blankets affixed directly to the drill rig, or the construction of permanent new perimeter block walls adjacent to affected receptors (or some combination thereof), drilling and re-drilling noise levels would have a less than significant impact at nearby receptors adjacent to Drill Sites #5, #6 and #7. Specifically, if drilling and re-drilling were to occur in the north portion of Drill Site #5, or the western/northern portion of Drill Site #6, new perimeter barriers shall be installed to ensure Project noise levels at nearby residences and commercial receptors is sufficiently controlled and contained onsite (Sespe 2022b).

Through continued adherence to the existing conditions of approval described in Section 1.2, and implementation of **MM NOISE-1**, **NOISE-2**, and **NOISE-3** described above, Project impacts to nearby receptors would be less than significant.

NOI (b). Would the Project result in generation of excessive groundborne vibration or groundborne noise levels?

Less than Significant. Ongoing operations consist of well servicing and maintenance, re-drilling operations, oil processing, storage and transfer, natural gas and natural gas liquids processing, storage and transfer, produced water separation and injection, and electrical production from a natural gas turbine-powered generator. These activities have not been observed to create ground vibration at or beyond the property line. As such, impacts associated with ongoing operations would be less than significant.

New project activities would result in varying degrees of temporary ground vibration, depending on the specific off-road equipment used and operations involved. Ground vibration generated by off-road equipment spreads through the ground and diminishes in magnitude with increases in distance. The effects of ground vibration may be imperceptible at the lowest levels, with low rumbling sounds and detectable vibrations at moderate levels, and damage to nearby structures at the highest levels.

The FTA's Transit Noise and Vibration Impact Assessment (FTA 2018) document provides guidelines for assessing vibration impacts resulting from construction activities. Table 3.11-14 below lists reference vibration source levels for common types of equipment, in terms of peak particle velocity (PPV) in units of inches per second at a reference distance of 25-feet.

Table 3.11-14: Vibration Source Level for Equipment

Equipment	PPV (inches/second) 25 feet
Vibratory Roller	0.210
Large bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003

Source: Caltrans 2020; FTA 2018

To assess Project vibration impacts at each receptor location, the reference PPV value of 0.089 inches per second (i.e., caisson drilling and/or large bulldozer) was utilized, as it was assumed that nothing larger or more powerful than the drill rig or large bulldozer would operate on the Project site near nearby receptors. The distance shown represents the measured distance from the closest boundary of the active operational areas to the nearest receptor. Using this information, Table 3.11-15 summarizes the predicted groundborne vibration impacts resulting from Project operations. Significance was determined by comparing the predicted change in groundborne vibration to the applicable Caltrans vibration threshold of 0.035 PPV for human receptors.

Table 3.11-15: Predicted Project Vibration Levels at Receptors

Drill Site	Receptor	Receptor Type	Distance (feet)	Predicted Vibration PPV (in/sec) ^a	Applicable Threshold PPV (in/sec)	Potentially Significant?
#1	R1	Residence	960	0.002	> 0.035	No
	R2	Commercial	180	0.010	> 0.035	No
	R3	Commercial	155	0.012	> 0.035	No
	R4	Commercial	180	0.010	> 0.035	No

Drill Site	Receptor	Receptor Type	Distance (feet)	Predicted Vibration PPV (in/sec) ^a	Applicable Threshold PPV (in/sec)	Potentially Significant?
#2	R5	Commercial	400	0.004	> 0.035	No
	R6	Commercial	385	0.004	> 0.035	No
	R7	Industrial	385	0.004	> 0.035	No
#3	R8	Residence	705	0.002	> 0.035	No
	R9	Commercial	1,010	0.002	> 0.035	No
	R10	Commercial	495	0.003	> 0.035	No
	R11	Commercial	300	0.006	> 0.035	No
	R12	Industrial	215	0.008	> 0.035	No
#4	R13	Residence	550	0.003	> 0.035	No
	R14	Commercial	130	0.015	> 0.035	No
	R15	Commercial	175	0.010	> 0.035	No
#5	R16	Residence	170	0.011	> 0.035	No
	R17	Residence	125	0.015	> 0.035	No
	R18	Residence	525	0.003	> 0.035	No
#6	R19	Residence	167	0.011	> 0.035	No
	R20	Residence	360	0.005	> 0.035	No
	R21	Commercial	135	0.014	> 0.035	No
#7	R22	Commercial	132	0.014	> 0.035	No

Source: Sespe 2022b

Notes: a. The Project vibration levels shown above are considered “barely perceptible” per Caltrans/FTA guidance (Caltrans 2020).

As shown in Table 3.11-15, estimated Project vibration levels experienced at nearby receptors are below the applicable Caltrans significance criteria for human receptors. Note that because the human receptor threshold of 0.035 PPV is more conservative than the building threshold of 0.1 PPV (in/sec), it can also be presumed that the Project’s vibration levels would not have the potential to damage nearby historic buildings or other critical sites. Note that the predicted Project vibration levels generated at nearby human receptors would be considered “barely perceptible” per the applicable Caltrans criteria for human response (i.e., ≤ 0.035 PPV inches per second). Therefore, groundborne vibration impacts to nearby receptors resulting from Project operations would be less than significant with no mitigation required.

NOI (c). For a project located within the vicinity of a private airstrip or 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?

Less than Significant. The proposed Project site is located within 2.0 miles of a public airport or public use airport. Specifically, the Long Beach Airport is located approximately 1.0 miles away to the northeast of CUP Site #5. While the Project site is located within 2.0 miles of a public airport, none of the drill sites are located within the “65 dB CNEL Noise Contour” area as designated by the Los Angeles County Airport Land Use Commission, nor are any of the drill sites located within the Planning Boundary/Airport Influence Area or Runway Protection Zone (Los Angeles County Airport Land Use Commission 2003). Furthermore, the Project does not involve creation of new noise-sensitive land uses (i.e., residences). For these reasons, the Project would have a less than significant impact related to airport/airstrip noise levels, with no mitigation required.

3.12 Transportation

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. TRANSPORTATION. Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.12.1 Environmental Setting

Signal Hill’s transportation system includes roads of varying sizes and capacities; public transportation systems which consist of bus, light rail, and paratransit service; airports; and seaports. Roadways in Signal Hill are used for both local and pass-through traffic between neighborhoods in Long Beach. Major north-south through routes include Cherry and Orange avenues, and major east-west through routes include Spring and Willow streets and Pacific Coast Highway (City 2009b). The San Diego Freeway (Interstate 405) crosses the northern portion of the City and is owned and maintained by Caltrans.

Access to the drill sites is provided by the following roadway types which are located throughout Signal Hill: principal arterial, minor arterial, collector street, and local street. Principal arterials support the heaviest traffic volumes and serve traffic within Signal Hill as well as traffic passing through the city. Minor arterials serve traffic traveling to local destinations

and connect the various parts of Signal Hill and nearby areas. Collector streets collect local traffic from residential neighborhoods and commercial and industrial areas. Collectors carry less traffic than minor arterials and feed traffic to minor and principal arterials. Local streets carry the lowest traffic volumes of all streets in the city, and mostly provide access to local destinations, rather than passing through traffic (City 2009b). Currently SHP vehicles travel between the drill sites along the following public roadways in the City: E. Sprint Street, Orange Avenue, E. 29th Street, Walnut Avenue, E. Willow Street, Junipero Avenue, Comellback Drive, Temple Avenue/Obispo Avenue, and E. Grant Street.

The City evaluated traffic operations and congestion impacts, in addition to VMT impacts, for its General Plan Housing Element update, which was adopted September 27, 2022 (City 2022c). In the traffic impact study for the Housing Element (Meridian Consultants 2022), the City identified its most congested intersections and roadway segments and evaluated the level of service (LOS) and congestion impacts from the future build-out of its Housing Element. Congested segments included the north-south roadways of Orange Avenue, Walnut Avenue, and Cherry Avenue and the east-west roadways of Spring Street, Willow Street, and Burnett Street as well as the main signalized intersections in this grid roadway network. The transportation analysis conducted for the City's Housing Element update found that these existing operational deficiencies were especially pronounced during morning and evening weekday peak hours, specifically between the hours of 7 and 9 am. and 4 to 6 pm., Monday through Friday (Sespe 2022c). The drill sites are located generally within or just outside these roadway areas and existing drill site daily operational traffic (which would remain the same on a permanent basis with implementation of the Project) currently occurs on these major roadways (Sespe 2022c). Temporary increases in vehicle trips related to the Project would also occur on these same roadways.

A total of 12 to 14 employees per day would continue to work at the seven drill sites during the course of normal operations. During intermittent redrilling operations, an additional four to eight employees/vendors per day would work at the specific drill site(s) where the activities are occurring. Employee vehicular access and parking would continue to be provided by existing access points which are gated and locked and designated parking areas. No change from historical activity is proposed or anticipated for ongoing operations at the drill sites. Table 2.4-1 in the Project Description summarizes the current activities and associated average vehicle trips and travel distance associated with existing operations which would continue under the Project. Based on the table, the maximum number of daily trips if all existing operations occurred concurrently, including drilling/redrilling, would be 60 vehicle trips per day (equivalent to 30 roundtrips, and an estimated 173 per day) spread across the seven drill sites. This represents a maximum, as it is not typical for all operations to occur at the same time. The average trips per day required for current operations at the drill sites would not increase under the Project.

3.12.2 Regulatory Setting

The U.S. Department of Transportation is the primary federal department concerned with transportation regulation and consists of multiple agencies, including the FHWA, FTA, and Federal Motor Carrier Safety Administration. Federal transportation regulations are primarily found in CFR 23 and 49. Caltrans is the primary state agency responsible for implementing regulations on the state's highways and freeways. State regulations are primarily found in California's Streets and Highways Code and Vehicle Code and regulate many aspects of transportation such as truck operation and routes.

3.12.2.1 Senate Bill 743

The Office of Planning and Research published its proposal for the comprehensive updates to the CEQA Guidelines in November 2017 which included proposed updates related to analyzing transportation impacts pursuant to Senate Bill 743. These updates indicated that VMT be the primary metric used to identify transportation impacts. In December of 2018, Office of Planning and Research published the most recent version of the Technical Advisory on Evaluating Transportation Impacts (December 2018), which provides guidance for VMT analysis. The Office of Administrative Law approved the updated CEQA Guidelines and lead agencies were required to implement the updated guidelines by July 1, 2020.

3.12.2.2 County of Los Angeles

The County of Los Angeles adopted transportation analysis methods and project CEQA thresholds through the Transportation Impact Analysis Guidelines document (Los Angeles County Public Works 2020). Many of the Los Angeles County methods and criteria included in the document are the same as those published by OPR in their Technical Advisory document, including the net increase of 110 or more daily vehicle trips. In addition to trip count screening thresholds, the County's document also provides baseline VMT per capita data which can be used to determine a project's potential transportation impacts under CEQA. Specifically, Los Angeles County has adopted a threshold of 16.8 percent below the existing VMT of the region (North County or South County). For the South County region, which includes the City and the Project area, the existing baseline VMT per capita is an average of 18.4 miles per employee per day. Therefore, by applying the 16.8 percent below baseline metric, an appropriate VMT threshold for the Project would be approximately 15.3 VMTs per employee per day (Sespe 2022c).

3.12.3 Impact Assessment

TRA (a). Would the Project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Less than Significant with Mitigation Incorporated. The average vehicle trips per day for ongoing Project operations are presented in Table 2.4-1 and would remain unchanged under the Project. As such, ongoing operations would not create additional vehicle trips on roadways within the City of Signal Hill that could potentially conflict with a program, plan, ordinance or policy addressing the circulation system. Additionally, the ongoing operation of the existing facilities would not change the way vehicles access the existing drill sites onto adjacent public roadways or require the construction of new access roads or alterations of existing roadways, or bicycle/pedestrian facilities. Existing ingress/egress access points would continue to sufficiently serve the drill sites throughout the proposed 20-year life of the Project. As a result, the ongoing operation of the existing facilities would not impact any City program, plan, ordinance, or policy related to transit, roadway, bicycle, or pedestrian facilities, and impacts would be less than significant.

With regard to new Project activities, vehicle trips would be generated during construction of the proposed gas system modifications at CUP Site #2, construction of new well cellars, and drilling/redrilling of new wells. Table 2.5-5 summarizes the vehicle trips associated with construction of the gas modification system, well cellar construction, and drilling and redrilling activities with the total daily VMT calculated under the conservative assumption that the temporary vehicle trips associated with construction activities construction of new well cellars and the gas system modifications occurred within a single day. As summarized in Table 2.5-2, the new project activities would generate an estimated maximum of 36 additional daily vehicle trips (equivalent to 18 roundtrips, and an estimated 94 VMTs per day) due to employees, contractors, and heavy-duty work trucks travelling to and from the drill sites. These additional vehicle trips would be temporary, and once construction is complete, would not contribute to additional ongoing daily vehicles trips associated with operations. Assuming a minimum of 18 employees per day, the calculated VMT per capita (i.e., per employee) would be 5.3 VMTs per employee per day (i.e., 94 VMT/18 employees), which is below the calculated Los Angeles County threshold of 15.3 VMTs per employee per day (refer to Section 3.11.2.2 above).

As discussed above, per SB 743 and OPR's subsequent guidance related to CEQA transportation evaluations, a project's Level of Service (LOS) effects related to roadway capacity, vehicle delays and traffic congestion are no longer considered under CEQA. LOS is a technical engineering non-CEQA criteria used to evaluate the delays at intersections and roadway segments and uses a grading system of LOS A through LOS F to describe the operational characteristics with LOS A indicating free flowing operations with little delay and LOS F indicating long delays and congestion. Typically, LOS D or better are considered accepted traffic operations. While construction activities associated with the gas system modifications at CUP and well cellar

construction would generate some additional vehicle activity on Signal Hill roadways, these effects would be temporary, and the total number of additional vehicles would be minimal compared to existing traffic volumes. Other than these temporary effects, the proposed Project would not generate any new permanent daily vehicle trips (i.e., continue to generate a small number of daily trips spread out throughout the day). The continuation of the existing level of daily vehicle travel from SHP's existing operations would have a less than significant impact on roadway operations. Temporary increases in truck trips generated by the Project could have a potentially significant impact if the timing of those trips occurred during peak hours and contributed to congestion within City-designated congested roadway segments. As discussed below, implementation of **MM TRA-1** would ensure that impacts would be reduced to less than significant.

Mitigation Measures

MM TRA-1: During temporary construction activities, specifically construction of the gas system modifications at Drill Site #2 and/or well cellar construction, larger equipment and construction material deliveries shall be avoided during peak hours. Specifically, heavy-duty trucks shall abstain from travelling to and from the drill sites between the hours of 7:00 a.m. and 9:00 a.m., and 4:30 p.m. and 6:30 p.m., Monday through Friday.

Residual Impacts

Incorporation of **MM TRA-1** would ensure that the new Project activities would not exacerbate existing congestion problems within the City, specifically as a result of larger and slower-moving heavy-duty trucks moving to and from the drill sites to facilitate construction. With implementation of this measure, the temporary increase in vehicle trips generated by Project construction would have a less than significant impact on the traffic system and would not conflict with any transportation-related program, plan, ordinance, or policy.

TRA (b). Would the Project conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?

Less than Significant. State CEQA Guidelines Section 15064.3(b) sets forth criteria for analyzing transportation impacts, with the applicable methodology based on project type, and specifying other criteria for conducting VMT analysis. Daily trips for ongoing Project operations would remain at the same level of daily trips described in Table 2.4-1. This would not represent any increase in baseline levels and therefore would have no impact.

As detailed for impact criteria (a), conservatively accounting for all new Project vehicle activity, including goods movements converted to automobile trips, the Project would temporarily increase trips per day by a maximum of 36 additional daily vehicle trips (equivalent to 18 roundtrips, and an estimated 94 VMTs per day) during construction. This maximum is based on a conservative assumption that construction associated with Project activities (well cellars and the gas system modifications) occurs simultaneously on the same day. Daily trips for Project

operations following completion of new well cellars and upgrades to the natural gas facility would remain at the same level as current operations described in Table 2.4-1. New Project activities would not result in any permanent increases in on- or off-site vehicle activities compared to existing baseline levels.

The Project's maximum daily vehicle trip count is below OPR's screening threshold of 110 trips per day, as well as the County's VMT threshold of 15.3 VMTs per employee per day, or 16.8 percent below the existing baseline VMT per capita levels within the South County region. Therefore, the new Project activities would result in less than significant transportation impacts as described in the Technical Advisory on Evaluating Transportation Impacts (OPR 2018). Accordingly, new Project activities would not conflict or be inconsistent with CEQA Guidelines detailed in Section 15064.3, subdivision (b) and, therefore, impacts would be less than significant.

TRA (c). Would the Project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less than Significant. Ongoing operations would not increase vehicle trips or result in any hazards due to design features or incompatible uses. Existing site access would remain the same and impacts would be less than significant.

New Project activities would not result in permanent changes or increases in the number of existing delivery and employee/contractor daily vehicle trips during operations, or changes to the existing ingress/egress at drill site access points. The Project would not create roadway hazards due to geometric design features or incompatible uses. Temporary increases in vehicle trips during construction activities for new well cellars and the gas system modification would not increase hazards or require any road or driveway improvements. Therefore, new Project activities would not result in alterations to nearby roadways, installation or expansion of driveways or geometric design features, or creation of incompatible uses along these roadways, and impacts would be less than significant.

TRA (d). Result in inadequate emergency access?

Less than Significant. Ongoing operations would not result in any physical development or other changes to the drill sites or site access, such that emergency access would be reduced or otherwise adversely affected. Existing emergency access points and adjacent public roadways would have sufficient capacity to continue to serve the existing number of vehicles traveling to and from and between each drill site. Project equipment and vehicles would continue to be parked off public roads within designated onsite parking areas and would not block emergency access routes. Ongoing operations would not require road closures or increase daily vehicle trips. Therefore, impacts on emergency access in the Project vicinity would be less than significant.

New Project activities would not result in any physical development or other changes to the drill sites or access to the sites, such that emergency access would be reduced or otherwise adversely affected. Existing emergency access points and adjacent public roadways would have sufficient capacity to serve the temporary increase in vehicle trips associated with construction traveling to and from each drill site. Project equipment and vehicles would be parked off public roads within designated onsite parking areas and would not block emergency access routes. Additionally, no road closures are proposed as part of Project activities. Project construction for well cellars and gas system modifications would increase daily vehicle trips, but the increase would be temporary and would not impede emergency vehicle access. Therefore, impacts on emergency access in the Project vicinity would be less than significant.

3.13 Tribal Cultural Resources

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. TRIBAL CULTURAL RESOURCES.				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: <ul style="list-style-type: none"> i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.13.1 Environmental Setting

A search of the Sacred Lands File by the NAHC was requested on June 8, 2022, to determine whether Sacred Lands have been recorded by California Native American tribes within the drill sites (ECORP 2022b).

The Sacred Lands file database results were received from NAHC on July 8, 2022. The results indicate that the Project area is positive for tribal cultural resources and included a recommendation to contact the Gabrielino/Tongva San Gabriel Band of Mission Indians for

information. The City mailed letters initiating the AB52 process concurrent with the Notice of Preparation on December 23, 2022 to the following tribes:

- Gabrieleño Tongva Indians of California Tribal Council
- Gabrieleño Tongva San Gabriel Band of Mission Indians
- Gabrieleño Tongva Nation of Greater Los Angeles Basin
- Gabrieleño Band of Mission Indians Kizh-Nation

The City received one response with a request for consultation from the Gabrieleño Band of Mission Indians Kizh-Nation on January 4, 2023. The City communicated via email with a representative of the tribe through June 20, 2023, including submittal of draft language for the mitigation measures. Based on the results of the conversation, AB52 consultation is considered complete. No other responses to the mailed letters were received.

3.13.2 Regulatory Setting

3.13.2.1 Assembly Bill 52

AB 52 requires lead agencies to consult with California Native American tribes that have requested formal consultation on a project. Accordingly, PRC sections 21080.3.1 and 21080.3.2 require that the lead agency provide for formal notification to the designated contact of, or a tribal representative of, traditionally affiliated California Native Tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. AB 52 was ratified to provide Tribes with an ancestral connection to a project area the opportunity to provide information on the presence of potential tribal cultural resources.

3.13.2.2 California Native American Heritage Commission

In 1976, the California State Government passed AB 4239, establishing the NAHC as the primary government agency responsible for identifying and cataloging Native American cultural resources. As such, one of the NAHC's primary duties is to prevent irreparable damage to designated sacred sites, as well as prevent interference with the expression of Native American religion in California. The bill authorized the NAHC to act to prevent damage to and insure Native American access to sacred sites. The NAHC can request that the court issue an injunction for the site, unless it found evidence that public interest and necessity required otherwise. The NAHC has authority to identify a Most Likely Descendant when Native American human remains are discovered any place other than a dedicated cemetery. Most Likely Descendants are granted the legal authority to make recommendations regarding the treatment and disposition of the discovered remains. These recommendations, although they cannot halt work

on the project site, give Most Likely Descendants a means by which to ensure that the Native American human remains are treated in the appropriate manner (NAHC 2022).

3.13.3 Impact Assessment

TCR (a). Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

- i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or***
- ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.***

Less than Significant with Mitigation. The City is required to comply with AB 52, and as such, sent letters notifying Tribes of the Project and providing contact information should Tribes request formal consultation under AB 52 with the City on the Project's potential to impact tribal cultural resources. Ongoing operations would not require new excavation activities and therefore impacts on tribal cultural resources would be less than significant. Ground disturbing activities associated with excavation for new Project construction, including new well cellars and installation of upgrades to the natural gas processing plant could have a potentially significant impact on tribal cultural resources if present.

Based on the Sacred Lands file database results provided by NAHC, the Project area is positive for tribal cultural resources and the NAHC recommended that the Gabrielino/Tongva San Gabriel Band of Mission Indians be contacted for information. All the CUP sites have experienced prior disturbance and the probability of a tribal cultural resource present in the subsurface is low. As described in Section 3.13.1, the City received one request for consultation from the Gabrieleño Band of Mission Indians Kizh-Nation. In accordance with AB 52 (Public Resources Code Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, and 21084.2), the City of Signal Hill initiated communication with the Gabrieleño Band of Mission Indians Kizh-Nation to determine if the project site is within their ancestral tribal settlements and/or trade routes or otherwise of importance to Native Americans, which indicate a potential for encountering tribal cultural resources within the project site. Consultation was completed on June 20, 2023. Through communication with the Tribe, it was concluded that the area has the likely presence of subsurface cultural resources. As such, impacts are potentially significant.

As a result of consultation with the Tribe, the Project shall incorporate the mitigation measures listed below, which would reduce Project's impacts to less than significant.

Mitigation Measures

While impacts to an archaeological resource are unlikely due to the prior disturbance activities, the City would ensure that SHP implements MM TCR-1, TCR-2, and TCR-3, in addition to MM CUL-1, to avoid impacts to tribal cultural resources to the extent feasible.

Mitigation Measure TCR-1. Retain a Native American Monitor Prior to Commencement of Ground-Disturbing Activities:

SHP shall retain a Native American monitor from (or approved by) the Gabrieleño Band of Mission Indians – Kizh Nation (the "Kizh" or the "Tribe") – the direct lineal descendants of the project location, prior to the commencement of any new "ground-disturbing activity" for the subject project, at all project locations (i.e., both on-site and any off-site locations that are included in the project description/definition and/or required in connection with the project, such as public improvement work). "Ground-disturbing activity" includes, but is not limited to, pavement removal, potholing, auguring, grubbing, tree removal, grading, excavation, and trenching, other than those activities associated with emergencies that require immediate corrective action. A copy of the executed monitoring agreement shall be provided to the City of Signal Hill prior to the earlier of the commencement of any ground-disturbing activity for the Project, or the issuance of any permit necessary to commence a ground-disturbing activity.

SHP shall provide the Tribe with a minimum of 30 days advance written notice of the commencement of any project ground-disturbing activity other than emergency repair work and regular maintenance, so that the Tribe has sufficient time to secure and schedule a monitor for the Project. SHP shall hold at least one pre-construction sensitivity/educational meeting prior to the commencement of any ground-disturbing activities, where a senior member of the Tribe will inform and educate the Project's construction and managerial crew and staff members (including any project subcontractors and consultants) about the TCR mitigation measures and compliance obligations, as well as places of significance located on the project site (if any), the appearance of potential TCRs, and other informational and operational guidance to aid in the project's compliance with the TCR mitigation measures.

The monitor will complete daily monitoring logs that will provide descriptions of the relevant ground disturbing activities, the type of construction activities performed, locations of ground disturbing activities, soil types, cultural-related materials, and any other facts, conditions, materials, or discoveries of significance to the Tribe. Monitor logs will identify and describe any discovered TCRs, including but not limited to, Native American cultural and historical artifacts, remains, places of significance, etc., (collectively, tribal cultural resources, or "TCR"), as well as any discovered Native American (ancestral) human remains and burial goods. Copies of monitor logs will be provided to the project applicant/lead agency upon written request.

Native American monitoring for the Project shall conclude upon the latter of the following: (1) written confirmation from a designated project point of contact to the Tribe that all ground-disturbing activities and all phases that may involve ground-disturbing activities on the Project site and at any off-site Project location are complete; or (2) written notice by the Tribe to the SHP and/or City of Signal Hill that no future, planned construction activity and/or development/construction phase (known by the Tribe at that time) at the Project site and at any off-site Project location possesses the potential to impact TCRs.

Mitigation Measure TCR-2: Discovery of TCRs, Human Remains, and/or Grave Goods

Upon the discovery of a TCR, all construction activities in the immediate vicinity of the discovery (i.e., not less than the surrounding 50 feet) shall cease. The Tribe shall be immediately informed of the discovery, and a Kizh monitor and/or Kizh archaeologist will promptly report to the location of the discovery to evaluate the TCR and advise the project manager regarding the matter, protocol, and any mitigating requirements. No Project construction activities shall resume in the surrounding 50 feet of the discovered TCR unless and until the Tribe has completed its assessment/evaluation/recovery of the discovered TCR and surveyed the surrounding area. The Tribe will recover and retain all discovered TCRs in the form and/or manner the Tribe deems appropriate in its sole discretion, and for any purpose the Tribe deems appropriate, including but not limited to, educational, cultural and/or historic purposes.

If Native American human remains and/or grave goods are discovered or recognized on the Project site or at any off-site project location, then all construction activities shall immediately cease. Native American “human remains” are defined to include “an inhumation or cremation, and in any state of decomposition or skeletal completeness.” (Pub. Res. Code § 5097.98 (d)(1).) Funerary objects, referred to as “associated grave goods,” shall be treated in the same manner and with the same dignity and respect as human remains. (Pub. Res. Code § 5097.98 (a), d)(1) and (2).)

Any discoveries of human skeletal material or human remains shall be immediately reported to the County Coroner (Health & Safety Code § 7050.5(c); 14 Cal. Code Regs. §15064.5(e)(1)(B)), and all ground-disturbing project ground-disturbing activities on site and in any other area where the presence of human remains and/or grave goods are suspected to be present, shall immediately halt and remain halted until the coroner has determined the nature of the remains. (14 Cal. Code Regs. § 15064.5(e).) If the coroner recognizes the human remains to be those of a Native American or has reason to believe they are Native American, he or she shall contact, within 24 hours, the Native American Heritage Commission, and Public Resources Code Section 5097.98 shall be followed. Thereafter, construction activities may resume in other parts of the Project site at a minimum of 200 feet away from discovered human remains and/or grave goods, if the Tribe determines in its sole discretion that resuming construction activities at that distance is acceptable and provides the project manager express consent of that determination (along with any other mitigation measures the Tribal monitor and/or

archaeologist deems necessary). (14 Cal. Code Regs. § 15064.5(f).) Preservation in place (i.e., avoidance) is the preferred manner of treatment for discovered human remains and/or grave goods.

Any historic archaeological material that is not Native American in origin (non-TCRs) shall be curated at a public, non-profit institution with a research interest in the materials, such as the Natural History Museum of Los Angeles County or the Fowler Museum, if such an institution agrees to accept the material. If no institution accepts the archaeological material, it shall be offered to a local school or historical society in the area for educational purposes. Any discovery of human remains and/or grave goods discovered and/or recovered shall be kept confidential to prevent further disturbance.

Mitigation Measure TCR-3: Procedures for Burials, Funerary Remains, and Grave Goods

As the Most Likely Descendant (“MLD”), the Koo-nas-gna Burial Policy shall be implemented for all discovered Native American human remains and/or grave goods. Tribal Traditions include, but are not limited to, the preparation of the soil for burial, the burial of funerary objects and/or the deceased, and the ceremonial burning of human remains. If the discovery of human remains includes four (4) or more burials, the discovery location shall be treated as a cemetery and a separate treatment plan shall be created. The prepared soil and cremation soils are to be treated in the same manner as bone fragments that remain intact. Associated “grave goods” (aka, burial goods or funerary objects) are objects that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed with individual human remains either at the time of death or later, as well as other items made exclusively for burial purposes or to contain human remains. Cremations will either be removed in bulk or by means necessary to ensure complete recovery of all sacred materials.

In the case where discovered human remains cannot be fully recovered (and documented) on the same day, the remains will be covered with muslin cloth and a steel plate that can be moved by heavy equipment placed over the excavation opening to protect the remains. If this type of steel plate is not available, a 24-hour guard should be posted outside of working hours. The Tribe will make every effort to divert the project while keeping the remains in situ and protected. If the project cannot be diverted, it may be determined that burials will be removed. In the event preservation in place is not possible despite good faith efforts by the project applicant/developer and/or landowner, before ground-disturbing activities may resume on the project site, the landowner shall arrange a designated site location within the footprint of the project for the respectful reburial of the human remains and/or ceremonial objects. The site of reburial/repatriation shall be agreed upon by the Tribe and the landowner and shall be protected in perpetuity.

Each occurrence of human remains and associated grave goods will be stored using opaque cloth bags. All human remains, grave goods, funerary objects, sacred objects and objects of cultural patrimony will be removed to a secure container on site if possible. These items will be

retained and shall be reburied within six months of recovery. The Tribe will work closely with the project’s qualified archaeologist to ensure that the excavation is treated carefully, ethically and respectfully. If data recovery is approved by the Tribe, documentation shall be prepared and shall include (at a minimum) detailed descriptive notes and sketches. All data recovery data recovery-related forms of documentation shall be approved in advance by the Tribe. If any data recovery is performed, once complete, a final report shall be submitted to the Tribe and the NAHC. The Tribe does not authorize any scientific study or the utilization of any invasive and/or destructive diagnostics on human remains.

Residual Impacts

Implementation of **MM TCR-1, TCR-2, TCR-3** as well as **MM CUL-1** would reduce potentially significant impacts resulting from inadvertent damage or destruction of known or unknown tribal cultural resources during ground disturbing activities associated with excavation for new well cellar and installing upgrades to the gas processing plant to a less than significant level.

3.14 Utilities and Service Systems

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS. Would the project:				
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.14.1 Environmental Setting

The City of Signal Hill owns and operates the municipal water system that services all business and residents located within City limits, including the Project area (City 2014). Signal Hill’s water supply consists primarily of groundwater produced from the Central Basin (approximately 90 percent) which is supplemented in times of high demand with treated surface water which is purchased from the Metropolitan Water District (City 2022b; City 2021a). The City’s municipal water system consists of the following: approximately 50 miles of distribution and transmission pipeline, one groundwater treatment facility, one Metropolitan Water District imported water connection, over 2,900 water service connections, three booster pump stations, three storage reservoirs, and two groundwater production wells (City 2022b).

The City of Signal Hill exclusively contracts with EDCO Disposal for solid waste and recycling collection services. The City requires that all residents, businesses, and developers within the city limits use EDCO for the collection of regular trash, recyclables, and debris (City 2022d).

The Los Angeles County Sanitation Districts provides sewage treatment service to the City of Signal Hill (Los Angeles County Sanitation Districts 2022). Signal Hill sanitary sewers connect to the City of Long Beach sewer line (City 2022c). The Los Angeles County Sanitation Districts consist of 24 independent special districts that provide wastewater and solid waste management for approximately 5.6 million people in Los Angeles County. The sewer system that serves the City of Signal Hill is owned and maintained by the Los Angeles County Sanitation Districts (District #29) (Los Angeles County Sanitation Districts 2022).

3.14.2 Regulatory Setting

No federal regulations are applicable to utilities and service systems associated with the Project. Applicable California regulations include the Solid Waste Reuse and Recycling Access Act (Public Resources Code Sections 42900-42911) and the Integrated Waste Management Act (Public Resources Code Sections 41000-41460).

3.14.2.1 Signal Hill General Plan

The Circulation Element (2009b) of the Signal Hill General Plan addresses utilities in goals and policies, as outlined in Table 3.14-1.

Table 3.14-1: Applicable City of Signal Hill General Plan Goals and Policies

Element	Goal	Policy	Applicability
Circulation	Goal 6: Provide safe, efficient, and environmentally-friendly utilities systems and pipelines.	Policy 6.a: Maintain essential access to petroleum resources by preserving pipeline facilities, where appropriate.	Project would support continued operation of drill sites and would maintain access to resources.
		Policy 6.b: Concurrent with development of vacant land or with substantial reconstruction of existing development, encourage the relocation of overhead utility systems to underground systems, where appropriate and feasible.	Project would not result in substantial reconstruction requiring relocation of utility systems.

Source: City 2009b

3.14.3 Impact Assessment

UT (b). Would the Project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Less than Significant. Potable water for operations conducted under CUP 97-03 is provided by the City of Signal Hill. SHP’s current operations consume an average of 9,500 gallons per day on normal operating days. Redrilling activities, which are part of operations, do not consume

additional water resources. Ongoing Project operations would not result in an increased demand for potable water, and impacts would be less than significant.

Additional potable water for new Project activities, including drilling new wells, would be provided by the City of Signal Hill. An additional 2,100 gallons of water per day is consumed when new wells are being drilled. SHP estimates that over the 20-year CUP period, it would drill up to 46 new wells (total of all new wells at the seven sites). The maximum number of new wells that would be drilled in any given year is five, and the average number of new wells to be drilled in a given year is two. In 2020, the City's potable water demand was 1,918 AF and the City's groundwater right in the Central Basin is 2,022 AFY (City 2021a). In 2020, the City's potable water supply was 97 percent groundwater and 3 percent imported water in 2020 (City 2021a). If the maximum number of new wells were drilled in a given year, this would result in approximately 0.64 AF of additional water, which is a small portion of the overall water supplied by the City annually. The Urban Water Management Plan prepared by the City of Signal Hill (City 2021a), determined based on analysis of historical rainfall data and associated demands, that there will be a surplus of supply during all average, single dry years, and multiple dry years (up to 5 years in succession) that may occur in the future. The proposed gas system modifications at CUP Site #2 would not increase water use for the Project. Following completion of drilling, the Project would not require additional potable water use. All water used in the waterflood operations would be produced water that is recycled and reinjected. Water produced by the production wells is 100 percent recycled for secondary recovery/waterflood operations in accordance with SHP's active Class II Underground Injection Control permit. New Project activities would not substantially increase water demand and impacts on sufficient water supplies during normal, dry, and multiple dry years would be less than significant.

UT (d). Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less than Significant. Minimal quantities of solid waste (non-hazardous) would continue to be generated as a result of ongoing operations at the drill sites (e.g., ongoing maintenance, equipment repairs, employee activities, etc.). Solid waste generated on-site by routine activities in support of oil and gas operations would continue to be properly handled and sent off-site for proper disposal by the local waste management company and would not exceed local landfill capacity. Ongoing operations would not generate additional significant demands for solid waste disposal, and no impact would occur in this regard.

New Project activities would not result in an increase in the quantity of non-hazardous solid waste generated at the drill sites during operations. Drilling new wells and well cellars and the upgrades to the natural gas processing facility at Drill Site #2 would generate minimal amounts of solid waste in addition to routine operations. Solid waste generated on-site by construction activities would be properly handled and sent off-site for proper disposal by the local waste

management company and would not exceed local landfill capacity. Implementation of Project activities would not generate additional significant demands for solid waste disposal, and impacts would be less than significant.

3.15 Cumulative Effects

This section identifies the potential cumulative effects of the Project when considered in combination with other past, present, or reasonably foreseeable future projects. The primary geographic area that was considered in the cumulative impact analysis is limited to the City of Signal Hill. The Signal Hill General Plan and other City web resources were utilized to identify past, present, and reasonably foreseeable projects. Cumulative impacts are defined in CEQA Section 15355 as follows:

Cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

- a. The individual effects may be changes resulting from a single project or a number of separate projects.
- b. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

In addition, CEQA Guidelines Section 15130(a)(1) states:

As defined in Section 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. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

Furthermore, CEQA Guidelines Section 15064(h)(4) states that the sole existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable.

3.15.1 Projects Identified for Cumulative Impact Analysis

This section identifies and describes past, present, and reasonably foreseeable projects physically located in the City of Signal Hill and their respective jurisdictional agency (Table 3.15-1 and Figure 3.15-1). The impacts of the Project were examined for the potential result in significant cumulative effects when examined in combination with the projects in this section.

Table 3.15-1: Projects Considered in the Cumulative Impact Analysis

Project Name	Description	Timeframe
Existing Oil Wells Outside CUP Drill Site Boundaries	Signal Hill is situated in the middle of the Long Beach Oil Field. The Royal Dutch Shell Company struck oil in 1921 becoming Signal Hill's first active oil in 1921. This subsequently introduced significant oil drilling and population growth to the area. There are presently approximately 502 active oil wells throughout the City of Signal Hill. These are owned and operated by various companies.	Past, Present
6 th Cycle Housing Element	This project represents the 6th cycle of housing assessment mandated by the State of California and was certified by the City Council in October 2022. Currently proposed are four separate development sites identified as both mixed use residential and solely residential totaling 517 new dwelling units, in order to meet the Governor's mandate to identify sites to accommodate the regional housing need. The total regional need is 1,341,827 housing units and Signal Hill's share is 516 units.	Present
Signal Hill Business Park	Signal Hill Business Parks is a nine-building industrial development proposal at approximately 150,000 square feet. This project is located at 2020 Walnut Ave on the west and east sides of Walnut Avenue, south of E. Hill Street. The applicant is Signal Hill XC, LLC. The zoning designation is light industrial. On October 19, 2021, the Planning Commission approved Site Plan and Design Review 21-07, Tentative Tract Map 80302, and found that a vacation of a portion of E. 21st Street in conformance with the City's General Plan. On November 9, 2021, the City Council adopted the second RMND, GPA 21-01, ZOA 21-02, and a Resolution of Intent to Vacate.	Reasonably Foreseeable
Housing Element Site 1 – Orange Bluff	Housing Element Site 1, "Orange Bluff" is a residential project located in the Central neighborhood. The capacity of Orange Bluff is 290 housing units. The 2-acre boundary is approximately 0.1 mile south of Drill Site #2. There is no anticipated timeframe for when this development will be constructed and occupied, although Signal Hill anticipates issuing a Request for Proposal mid-2023.	Reasonably Foreseeable
Housing Element Site 2 – Walnut Bluff	Housing Element Site 2 "Walnut Bluff" is a residential project located north of E. Willow Street, west of Town Center NW". The capacity of Walnut Bluff is 90 housing units. The 2-acre boundary is situated approximately 0.1 mile southwest of Drill Site #3. There is no anticipated timeframe for when this development will be constructed and occupied, although Signal Hill anticipates issuing a Request for Proposal mid-2023.	Reasonably Foreseeable

Project Name	Description	Timeframe
Housing Element Site 3 – Town Center NW	Housing Element Site 3 “Town Center NW” is located northeast of the intersection of E. Willow Street and Walnut Ave in the central neighborhood. The mixed-use commercial and residential project contains an anticipated 267 housing units. The 8.4-acre boundary is situated to include Drill Site #3 in its northeastern quadrant, but the Housing Element has determined the drilling site will remain. (2021-2029 Housing Element, page C-8) There is no anticipated timeframe for when this development will be constructed and occupied, although Signal Hill anticipates issuing a Request for Proposal mid-2023.	Reasonably Foreseeable
Housing Element Site 4 – Heritage Square	Housing Element Site #4: Heritage Square Central Business District is a mixed-use residential and commercial development project located northwest of the intersection of Cherry Avenue and E. Burnett Street. The site is approximately 8.8 acres and would include a maximum of 60 housing units. This site is located approximately 0.2 miles west of Drill Site #4. There is no anticipated timeframe for when this development will be constructed and occupied, although Signal Hill anticipates issuing a Request for Proposal mid-2023.	Reasonably Foreseeable
2599 E. Pacific Coast Highway	2599 E. Pacific Coast Highway is a proposed housing development that includes seven attached and detached single family housing units on an approximately 0.149-acre lot. The project applicant is a private agent for the owner of the lot.	Reasonably Foreseeable
2750 E. 20th Street	2750 E, 20th Street is a proposal to demolish a one-story single-family unit and construct three detached single-family units each with a two-car garage and three total additional parking spaces on an approximately 0.3 acre lot. The zoning designation for this project is Residential High Density.	Reasonably Foreseeable
1450 E. 27th St. and 2655 Walnut Avenue	This is a proposed two-building industrial development building, totaling 24,000 square feet. Building 1 is designed for industrial uses and Building 2 is designed as a flex space suitable for retail, office, or industrial uses. The applicant is 2H Property 3060, LLC.	Reasonably Foreseeable
2250 Ohio Avenue	Proposal to construct a two-story duplex in Planning Area 2 of the Hilltop Area Specific Plan (SP-2) zoning district. Each unit will have three bedrooms, two full bathrooms, one half-bathroom, and a two-car garage with private driveway spaces in front of the garage.	Reasonably Foreseeable
1900 Temple Avenue	Site Plan and Design proposal to construct a new 2,343 square-foot single-family dwelling on a vacant 8,165 square-foot lot.	Reasonably Foreseeable

Project Name	Description	Timeframe
2550 Orange Avenue	Center point properties indicated a transformation from previous golf course use to a potential industrial development site. The property area contains multiple abandoned and active oil wells that were located, mapped, and tested for methane emissions. A formal project proposal for this site has not yet been submitted to the City.	Reasonably Foreseeable
1901 Freeman Avenue	1901 Freeman Avenue is a proposal to construct a new 7,290 square foot building for use as a potential industrial or commercial development.	Present, and Reasonably Foreseeable
1701 Creston Avenue	1701 Creston Avenue is a proposal to construct a new 11,024 square foot building for potential industrial or commercial development.	Reasonably Foreseeable
The Courtyard - 1933-39 Temple Avenue	The Courtyard is a proposal to construct 8 detached two-story single-family dwellings with 5 additional off-street parking spaces. This residential development would directly contribute to an increase in the City of Signal Hill's population.	Reasonably Foreseeable
Signal Hill Environmental Justice Element	The City of Signal Hill is in the process of drafting an Environmental Justice element to the existing general plan. As defined by SB 1000, an Environmental Justice element is required if any of the census tracts within a city's limits are identified as disadvantaged communities. CalEPA designated the top 25% of census tracts in the OEHHA CalEnviroScreen 4.0 database to be disadvantaged communities. Of the three census tracts in Signal Hill (573401, 573402, and 573403), census tract 573402 meets this requirement with a percentile score of 79. (OEHHA 2023b). Drill Site #2 and Site #3 are located within this census tract.	Reasonably Foreseeable

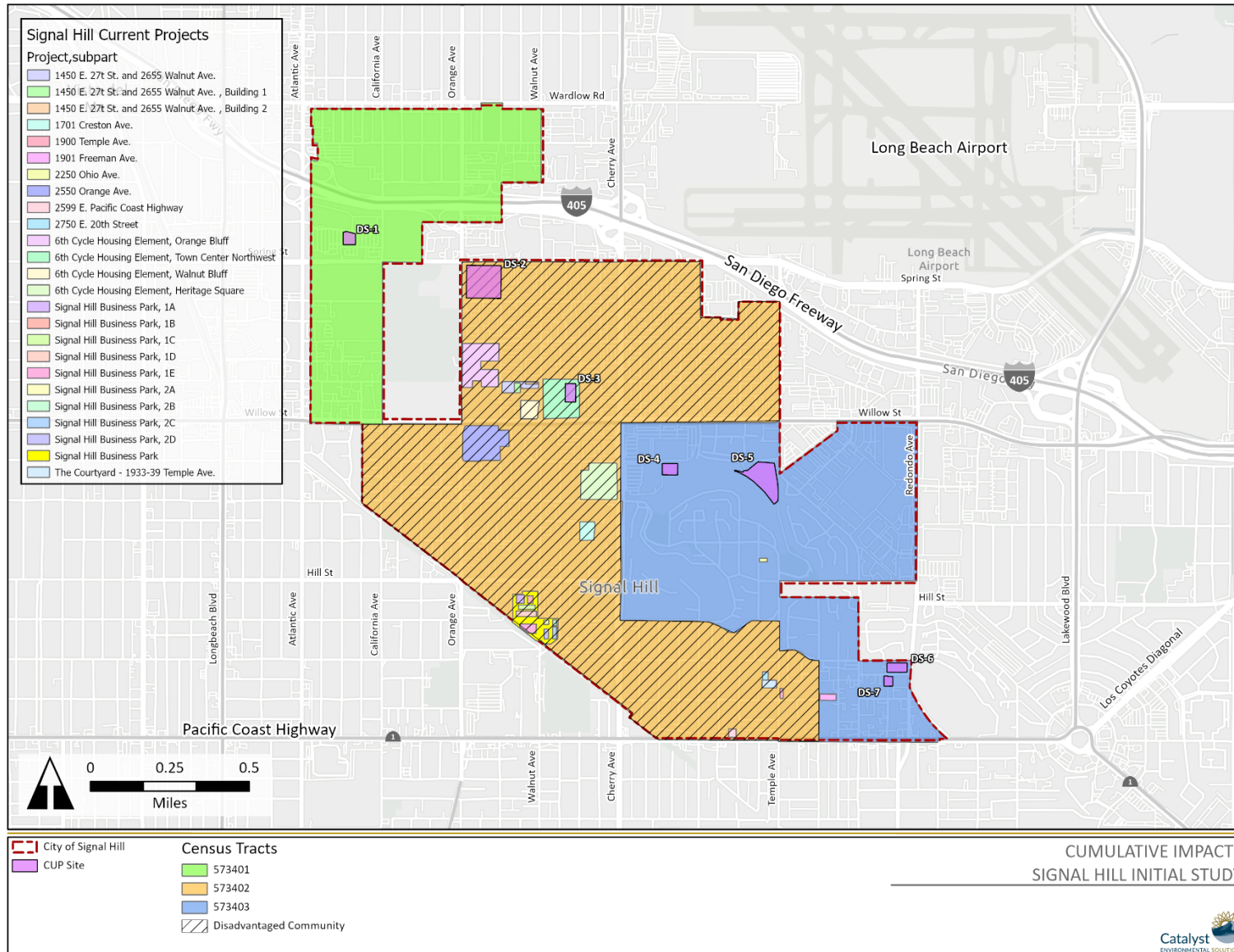


Figure 3.15-1: Project Considered in the Cumulative Effects Analysis

3.15.2 Analysis of Potential Cumulative Environmental Impacts

This section provides an analysis of the cumulative environmental impacts associated with this Project.

3.15.2.1 Aesthetics

As indicated in Table 3.15-1, the majority of reasonably foreseeable future projects considered in this analysis are new residential development projects. Construction of these projects could require some nighttime lighting for security purposes which if necessary and occurred concurrent with drilling or re-drilling at a drill site within the same viewshed could result in cumulative increase in overall nighttime lighting. However, all development projects would be required to be reviewed under the City's Plan Review process and associated CEQA reviews and would likely require similar mitigation measures as described in this EIR. Further, any nighttime lighting at the drill sites would be short-term and intermittent over the 20-year period during drilling and re-drilling operations and therefore, the Project contribution to cumulative impacts to visual resources would be less than significant.

3.15.2.2 Air Quality

As indicated in Table 3.15-1, the majority of reasonably foreseeable future projects considered in this analysis are new residential development projects which have been identified in order to meet the California state mandate to increase housing. Consequently, the increase in residential units would result in a proportional increase in the population in Signal Hill and the sensitive receptors living in close proximity to the drill sites (specifically near Drill Sites #3 and #4), and the 502 other active oil wells located throughout the City. Therefore, there is potential for an increase in exposure to air emissions from the cumulative emissions, considering the baseline operations of all existing wells in the City, in combination with the proposed additional Project components (i.e., drilling and re-drilling activities, operation of 46 new wells, construction and operation of 20 new well cellars, and construction and operation of LTS). The SCAQMD has established thresholds for individual projects and if the project emissions are below established thresholds, then the project is viewed as in compliance with the Air Quality Management Plan, and the project's cumulative impacts are found to be less than cumulatively considerable. As detailed in Section 3.2.3.3, the combined emissions for continued operation of the existing facilities in addition to construction and operations associated with the additional Project components are below applicable SCAQMD's daily emissions thresholds. For these reasons, the Project's potential impacts would not be cumulatively considerable, and the potential cumulative impact would be less than significant.

Comments received during the scoping period for the subject Project suggested that the City evaluate the potential for environmental justice impacts from the Project. An environmental justice impact is a significant and unavoidable impact that would adversely and

disproportionately affect a disadvantaged community. As shown in Figure 3.15-1, the seven drill sites are located across all three census tracts in the City and not disproportionately located in the one census tract that meets the definition of a Disadvantaged Community. Further, as described in Section 3.2 to 3.14, no significant and unavoidable adverse impacts would result from the Project. However, as shown in the table, the City is in the process of developing an Environmental Justice element to its General Plan, as required by Senate Bill 1000, and will follow the California Office of Planning and Research June 2020 Guidelines, including hosting public workshops, providing opportunities for public comment, and consideration of policies to reduce potential pollution burdens within the City.

3.15.2.3 Biological Resources

The construction of multiple residential development projects throughout the City could have varying degrees of impact on biological resources; however, because most of Signal Hill is developed, there is limited open space to support native vegetation and species. However, there is potential for construction-related impacts and ongoing impacts (vegetation maintenance activities) on wildlife that may be using trees or other vegetation present at project sites to nest or roost. These projects would require BMPs or other measures to avoid impacts as well. Although the Project has the potential to affect biological resources in the same general vicinity as other projects, given the mitigation measures that would be implemented to reduce or avoid impacts (e.g., pre-construction surveys, protection of nesting birds), the Project's contribution would not be cumulatively considerable and thus would be less than significant.

3.15.2.4 Cultural Resources

The entirety of the new construction projects proposed in Signal Hill could result in cumulative impacts to archaeological and historic resources, given the extent of ground-disturbance that would occur. As discussed in Section 3.5.3, any ground-disturbing activities at the drill sites has the potential to encounter unanticipated discoveries of archaeological or tribal significance. However, implementation of the required mitigation measures and compliance with State laws would reduce effects to less than significant levels. Therefore, the Project contribution to cumulative effects would be minimal.

3.15.2.5 Energy

The development of 517 new residential units as well as new commercial developments in the City will result in a cumulative net increase in energy demand, both electricity and natural gas. However, as described in the recently adopted City of Signal Hill Housing Element, the City has a Municipal Green Building Policy to provide guidance in the development of sustainable green building practices. To encourage and assist with sustainable development practices, the city has a residential green building primer information PDF available on the city website. Elements of

the primer include definitions; benefits; examples; objectives and methods for construction and design materials; construction recycling practices; landscaping; and appliances and furnishings. The city has adopted the Municipal Green Building Policy to encourage energy and resource efficiency developments, minimize environmental impacts, and meet minimum LEED Silver standard for construction of all new municipal buildings. In addition, all new development projects in the City would require project-specific CEQA analysis and site plan review to ensure the project complies with City policies and green building measures. Therefore, with the implementation of green building measures, cumulative effects to energy demand are anticipated to be less than significant. Further, the majority of the energy required by SHP is produced by the microturbine at Drill Site #2; therefore, the Project contribution to the cumulative increased demand would be negligible. Further, the Project would provide beneficial effects to offset the cumulative increase in demand for natural gas through the production of natural gas to be distributed by Southern California Edison for consumption by residential users.

3.15.2.6 Geology and Soils

The entirety of the new construction projects proposed in Signal Hill could result in a cumulative increase in erosion and dust through soil disturbance and excavation. As described in the Initial Study prepared for the Project, the Project is required to comply with dust control measures in accordance with SCAQMD Rule 403. Further, the potential ground-disturbance and excavation at the drill sites is minor compared to the size of the other projects considered in this analysis for potential development. Similarly, construction activities of all proposed developments have the potential to encounter unanticipated discoveries of paleontological significance. Implementation of the required mitigation measures would minimize the Project's contribution to these potential cumulative impacts.

3.15.2.7 Greenhouse Gas Emissions

The Project would generate GHGs from operations, electricity use, and combustion of gasoline/diesel fuels, each of which is regulated near the top of the supply-chain. As discussed above, crude oil production and refining are included in the AB 32 Cap-and-Trade Program, which requires purchase of California Carbon Allowances to mitigate GHG emissions associated with operations. The Cap-and-Trade Program serves to reduce GHG emissions from major sources (covered entities) by setting a firm cap on statewide GHG emissions from all covered entities while employing market mechanisms to cost-effectively achieve the emission-reduction goals. SHP is currently obligated to comply with the AB 32 Cap-and-Trade Program, which requires SHP to offset covered GHG emissions by providing California Climate Allowances. With respect to GHGs from electricity, the Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. The Project would meet its fair share of the cost to mitigate the cumulative impact of global climate change associated with electricity use because SHP is purchasing energy from the California

market. With respect to GHGs from use and combustion of gasoline/diesel fuels, the Cap-and-Trade Program also covers the GHG emissions associated with the combustion of transportation fuels in California, whether refined in-state or imported. The point of regulation for transportation fuels is when they are “supplied” (i.e., delivered into commerce). Accordingly, virtually all of GHG emissions from CEQA projects associated with VMT are covered under the Cap-and-Trade Program since fuel suppliers are required to purchase allowances to cover the carbon pollution produced when the fuel they supply is burned. Further, as summarized in Section 3.8.2.12, SCAQMD adopted an interim mass emissions threshold of 10,000 MTCO₂e per year for stationary source/industrial projects where SCAQMD is the lead agency. Although the SCAQMD is not the lead agency for this EIR, estimated GHG emissions are compared against this threshold for the purposes of evaluating relative impacts. As shown in Table 3.8-3 above, construction and operation of additional Project components will increase SHP’s annual GHG emissions by approximately 1,197.6 MTCO₂e/year in addition to the 41,756 MTCO₂e/year associated with continued operations of the existing facilities. For a relative comparison of Project-related GHG emissions to other significant source of GHGs in the region, the Port of Long Beach GHG emissions were 212,687 MTCO₂e/year (CARB 2022g). The Project-related increase in GHG emissions of 1,197.6 MTCO₂e/year is below the SCAQMD screening level threshold of 10,000 MTCO₂e/year for industrial projects. Per the interim SCAQMD guidance, Projects with incremental GHG emissions increases less than this threshold are not considered cumulatively considerable (i.e., those projects would not result in a significant cumulative effect). Thus, Project GHG emissions will be consistent with the relevant plan (i.e., AB 32 Scoping Plan). Therefore, the Project’s contribution to cumulative global climate change impacts would not be cumulatively considerable and impacts are considered less than significant.

3.15.2.8 Hazards and Hazardous Materials

As part of operations, hazardous materials are stored and transported at the drill sites. SHP follows the required spill control and contingency plans as well as HMBPs and would continue to update and maintain these plans as needed to reduce risks associated with storing hazardous materials. Other ongoing oil and gas production projects in the vicinity of the Project would require similar hazardous materials for operations as well as the required plans. In addition, the types of hazards that could occur from residential/industrial structure projects would likely be common to construction projects (e.g., accidental releases of hazardous materials, potential for encountering subsurface structures which could result in release of contaminants, and an increased risk of fire). These impacts would generally be site-specific and would not combine with impacts of other projects. Additionally, other projects would be required to comply with applicable regulations. Therefore, cumulative impacts would be less than significant.

3.15.2.9 Hydrology and Water Quality

The construction and occupation of numerous development projects in the City will result in a cumulative increase in water demand, as well as an increase in the acreage of impervious surfaces which could result in cumulative increases in stormwater runoff. As described in Section 2, all water required for continued operation of the wells on the seven drill sites would be supplied by the water produced during oil production. The proposed drilling activities would require an additional 0.64 AF of fresh water per year for the first 10 years of the CUP period. This represents 0.03% of the City's overall annual groundwater right in the Central Basin. Depending on the timing of construction of the other projects considered in this analysis, other projects would require water during construction as well as operations for residential and industrial structures, which would be supplied by the City during the same timeframe as the Project. However, due to the minor increase in water supply required for new Project activities, the Project contribution to cumulative impacts would be short-term and less than significant.

As described in Section 3.10, continued operation of SHP's waterflood operations at the drill sites would occur in accordance with their approved UIC permit issued by CalGEM which requires regular testing and reporting to demonstrate that all fluids are confined to the intended zone of injection well over 1,000 feet below the base of fresh water. Therefore, the Project would not result in adverse impacts to groundwater quality and would not contribute to any potential cumulative impacts to groundwater quality that may result from the other projects considered in this cumulative effects analysis.

With implementation of the standard industry BMPs and a SWPPP (Drill Site #5), the potential for impacts to surface and storm water quality from Project construction activities would be less than significant. Standard industry BMPs would be implemented during construction activities to minimize the potential of exposing site soils to erosion and mobilizing sediments in stormwater as well as preventing the accidental release of hazardous materials such as fuels, oils, grease, and lubricants from construction equipment. Construction of residential and industrial projects in the City would increase the amount of impervious surfaces which could increase stormwater runoff. However, other projects would be required to follow BMPs or SWPPPs, as applicable.

3.15.2.10 Noise

Ongoing operation of the existing facilities would continue to comply with the mandatory requirements of the applicable noise ordinance of the Signal Hill Municipal Code. With respect to new project activities, noise resulting from the drilling of new wells would be potentially significant. However, all Project activities would be required to comply with the mandatory requirements of the applicable noise ordinance of the Signal Hill Municipal Code. In addition, if any drilling or redrilling would occur within 600 feet of an occupied building, then Section 16.16.110 of the Signal Hill Municipal Code would require soundproofing sufficient to ensure that expected noise levels do not exceed the noise limits contained in Chapter 9.16 of Signal Hill

Municipal Code. In addition, the mitigation measures have been identified in this EIR that would reduce residual impacts to less than significant. Further, noise impacts are highly localized because noise dissipates rapidly. Thus, with implementation of the mitigation measures and compliance with the applicable regulations, the Project's contribution to potentially significant cumulative noise impacts would be minimal.

3.15.2.11 Transportation

As discussed in Section 3.12.3, new Project activities would result in increased vehicle trips during construction of the proposed gas system modifications at Drill Site #2, construction of new well cellars, and drilling/redrilling of new wells. Other projects in the vicinity of the Project area would directly contribute to an increase in the City's population by developing additional residential units. These projects could add traffic to the roadways used to access the drill sites.

The City conducted a transportation analysis as part of its General Plan Housing Element update which identified its most congested intersections and roadway segments and evaluated the impacts from the future build-out of its Housing Element. The drill sites are located generally within or just outside these congested roadway segment areas and existing drill site daily operational traffic as well as temporary increases in vehicle trips during new Project activities would occur on these major roadways (Sespe 2022c). The transportation analysis found that these existing operational deficiencies were especially pronounced during morning and evening weekday peak hours, specifically between the hours of 7 and 9 a.m. and 4 to 6 p.m., Monday through Friday (Sespe 2022c). To minimize Project impacts of increased traffic, mitigation is provided which limits heavy-duty truck trips during these peak travel hours. With implementation of the mitigation measures, the Project's contribution to potentially significant cumulative transportation impacts would be minimal.

3.15.2.12 Tribal Cultural Resources

As discussed in Section 3.13.3, ground-disturbing activities associated with excavation for new Project construction, including new well cellars and installation of upgrades to the natural gas processing plant, could result in destruction of or damage to tribal cultural resources if present, which would be a significant impact. Other projects described in Table 3.15-1 would require ground-disturbing construction activities to install foundations for residential housing units, which could also have the potential to affect known and unknown tribal cultural resources. Therefore, the cumulative impact on tribal cultural resources in the vicinity of the Project area could be potentially significant; however, the Project's contribution would be reduced through adopted mitigation measures is not likely to be cumulatively considerable or significant. While impacts to an archaeological resource are unlikely due to the prior disturbance activities, mitigation measures have been identified in this EIR that would avoid impacts to tribal cultural resources to the extent feasible. Similar measures would be required for other projects as part

of their environmental review process and AB 52 consultation. No additional mitigation for the Project is required.

3.15.2.13 Utilities and Service Systems

As discussed in Section 3.14.3, drilling new wells would result in a minor increase in water use above current operations at the CUP sites. If the maximum number of new wells were drilled in a given year for the proposed Project, this would result in approximately 0.64 AF of additional water, which represents approximately 0.03% of the City's overall groundwater right in the Central Basin. Other projects located throughout Signal Hill would require water during construction as well as operations for residential and industrial structures, which would be supplied by the City during the same timeframe as the Project. The Urban Water Management Plan prepared by the City of Signal Hill (City 2021a), determined based on analysis of historical rainfall data and associated demands, that there will be a surplus of supply during all average, single dry years, and multiple dry years (up to five years in succession) that may occur in the future. Potable water demands are projected to be 2,034 AF in 2040, which the City determined based upon 146 gallons per capita per day and the projected population of the future year (City 2021a). Due to the minor increase in water supply required for new Project activities, cumulative impacts would be less than significant. Minimal solid waste generated on-site as a result of construction activities would be properly handled and sent off-site for proper disposal by the local waste management company and would not exceed local landfill capacity. Due to the minor increase in waste generated for new Project activities, cumulative impacts would be less than significant.

3.16 Irreversible and Irretrievable Use of Resources

This section is prepared in accordance with CEQA Guidelines Section 15126.2 (d) identifying irreversible and irretrievable use of resources associated with the proposed Project. The use of these two resources produces primary impacts and particularly, secondary impacts such as expansion of access to previously inaccessible areas. Consideration of environmental accidents which may occur throughout the duration of the project must also be addressed as these can be considered irreversible and irretrievable uses of resources.

Relevant discussion and mitigation measures have been identified, relating directly to the projects utilization of resources considered irreversible and irretrievable, including potential environmental accidents.

3.16.1 Irreversible and Irretrievable Resources Used

Water use necessary for drilling operations would be considered the only irreversible use of resources. The Project and its action alternatives identified in Section 4.1 reduce the volume of water available to be utilized, however its use is consistent with the Project.

The Project would continue the operation of the seven drill sites and potentially drill up to five new wells per year. The only irreversible use of resources on site is the water purchased from the City of Signal Hill and utilized for new drilling operations. All other water is onsite produced water which is produced by the wells as part of SHP's permitted waterflood operation that is reinjected back into the producing formation in a closed-loop process and therefore does not constitute an irreversible use of resources.

No secondary impacts have been identified as no expansion into previously inaccessible areas has been proposed. All operations and drilling would remain the same and occur within the boundaries of the seven defined CUP drill sites.

3.16.2 Potential Environmental Accidents

Accidents may occur during operations at drill sites relating to hazardous substances and materials such as spills and fires. SHP complies with all federal, state, and local laws that require various prevention and action plans to minimize the potential for accidents to occur. Additional regulation and compliance information regarding action and prevention plans for hazards and hazardous materials are identified in Section 3.7.

3.17 Growth-Inducing Impacts of the Project

This section identifies growth-inducing effects of the proposed Project and its alternatives as required by CEQA Section 15126.2(e). This pertains to economic or population growth, or the construction of additional housing, induced directly or indirectly, in the surrounding environment. Growth also occurs when removing obstacles to population growth, such as removing a constraint on a public service. With population or economic growth, associated impacts such as increased utility and public service use, increased traffic and noise, air or water quality degradation, and habitat loss or degradation could occur.

There are no direct or indirect growth inducing impacts to Signal Hill associated with the continuation of the CUP. The continuation of drilling operations at the Project site does not require additional long-term employees and no housing will be constructed. The Project would not increase in the population at Signal Hill, nor would it place an associated strain on the city's public resources and services. All additional contractors, vendors, and construction workers would be hired as short-term employees and would not contribute to overall growth.

3.18 Significant and Unavoidable Impacts

No significant and unavoidable adverse impacts were identified.

SECTION 4 Alternatives to the Proposed Project

An important aspect of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed Project. Section 15126.6(a) of the CEQA Guidelines states that “an EIR shall describe a range of reasonable alternatives to a project or location of a project, which 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 and evaluate the comparative merits of the alternatives.”

CEQA Guidelines Section 15126.6(f) further states that “*the range of alternatives required in an EIR is governed by the ‘rule of reason’ that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project.*”

4.1 No Project Alternative

As stated in CEQA Guidelines Section 15126.6(e), the purpose of the No Project Alternative is “to allow decisionmakers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.” The No Project Alternative is defined as the existing conditions at the time the NOP was published and any conditions reasonably expected to occur in the foreseeable future (Section 1526.6(e)(2)).

Under the No Project Alternative, the City would not approve the 20-year extension of the CUP for the continued operation of the seven drill sites currently operated by SHP and would instead revoke Signal Hill Petroleum’s CUP. SHP would continue ongoing operations until the City Council and Planning Commission revoke the CUP, at which time, SHP would not be allowed to drill any new wells at the seven drill sites. However, as long as SHP continues to pay the annual fees for all of their existing wells to the City, SHP can continue existing operations, including redrilling of existing wells. This is covered in City Code Section 16.16.010, and 16.16.020 which only specify that a CUP is required to drill new wells. The No Project Alternative would include continued existing operations at all seven drill sites (including redrilling activities), and upgrades to the gas processing facility at Drill Site #2. In addition, under the No Project Alternative, SHP may construct new facilities on the drill sites or make other improvements that require only ministerial approval from the City.

SHP would continue to operate in accordance with all other applicable local (e.g. CalGEM and SCAQMD) and state regulations. Without an active CUP, all operations at the seven drill sites would continue without any City conditions of approval or annual review of drill site operations. The CUP provides a clear set of conditions for operations of each of the drill sites which have

been developed to address potential issues related to community compatibility such as noise, traffic, aesthetics, and security. Therefore, while this alternative would avoid potential air and greenhouse gas emissions associated with the drilling and operation of 46 new wells, the potential for significant impacts related to these other issues would be greater under the No Project Alternative than the proposed Project.

Aesthetics. Under the No Project Alternative all potential impacts from drilling during nighttime (requiring lighting) would be avoided. However, SHP would continue to conduct redrilling operations, therefore, the overall amount of potential nighttime operations and lighting would be the same as described for the Project. The City would no longer have the ability to enforce CUP conditions of approval related to fencing, landscaping or maintenance and could only address nuisance conditions if they occur (as per the municipal code). Accordingly, the potential impacts from new wells would be avoided, but the potential impacts from continued operations would be greater.

Air Quality. Short-term oil well drilling emissions that would result from the Project would be avoided but recommended CUP conditions of approval to minimize construction emissions from any future construction activities on the drill sites (other than drilling) would not be required. Less than significant long-term air emissions and health risks associated with the proposed new oil wells would also be avoided. However, there would be no CUP Annual Review accounting of SCAQMD permitting, inspections or violations.

Biological Impacts. The potential for short-term impacts to nesting birds, bat, and vegetation that may result during drilling activities would be avoided, but recommended CUP conditions of approval to minimize impacts during long-term operations (including redrilling and other construction proposed on the drill sites in the future) would not be implemented.

Cultural Resources. The potential for impacts to cultural resources from drilling or well cellar construction would be avoided, but recommended CUP conditions of approval to minimize potential impacts of other ground-disturbing activities would not be required. Therefore, the potential for impacts to cultural resources from continued operations might be greater under the No Project alternative.

Energy. Under the No Action Alternative, no new drilling would occur, and therefore energy consumption associated with drilling new wells would be avoided. All other ongoing operations which consume energy would continue under this alternative and the upgrades to the natural gas-powered turbine/electric generation facility which would improve efficiency would also be completed. However, there would be no CUP Annual Review accounting of permitting, violations, etc.

Geology and Soils. The potential for impacts to paleontological resources from drilling or well cellar construction would be avoided. Therefore, the potential for impacts to paleontological resources from continued operations would be less under the No Project alternative, as there would be fewer activities causing ground disturbance.

Greenhouse Gas Emissions. Short-term emissions of GHG during oil well drilling that would result from the Project would be avoided. Overall GHG emissions from continued operations would be less under the No Project Alternative because 46 fewer wells would be drilled and operating; however, under the No Project Alternative, increased redrilling activity and associated GHG emissions could result if the CUP were revoked. However, there would be no CUP Annual Review accounting of redrill operations that could be conducted.

Hazards and Hazardous Materials. As part of ongoing operations, hazardous materials are stored and transported at the drill sites. Under the No Project Alternative, SHP would continue to follow the required spill control and contingency plans as well as HMBPs, as required under state law, and would continue to update and maintain these plans as needed to reduce risks associated with storing hazardous materials. Under the No Project Alternative, there would be no significant change to the quantity of hazardous materials, the rate of their transportation, risk of release, or proximity to schools or airport as compared to the proposed Project. Therefore, impacts under the No Project Alternative would be similar to the Project. However, there would be no CUP Annual review of drill site operations to inform the City of any spills that may have occurred in a given year, or likewise to demonstrate lack of spills.

Hydrology and Water Quality. All less than significant impacts on hydrology and water quality associated with the proposed Project would remain the same under the No Project Alternative. SHP would continue to operate its waterflood program and recycling/reinjection of produced water in accordance with its Underground Injection Control permit issued by CalGEM. Current water use for ongoing operations would continue under this alternative. However, this alternative would avoid an increase in potable water use at the drill sites, because no new wells would be drilled. Redrilling operations, which would continue under the No Project Alternative, do not require additional water.

Noise. The No Project Alternative would avoid the potential for increased noise levels associated with drilling new wells; however, ongoing operations at the drill sites would continue which includes redrilling activities. SHP would continue to comply with applicable provisions of the Signal Hill Municipal Code related to noise but would not be required to implement the CUP conditions of approval relating to noise at the drill sites and there would be no CUP Annual Review reporting of noise complaints or successful mitigation.

Transportation. The No Project Alternative would avoid potential traffic generated to drill new wells, but worker trips and truck trips associated with redrilling and other continued operations would occur. In addition, the potential exists that SHP may construct additional facilities other than wells on the drill sites in the future and there would be no opportunity to apply CUP conditions of approval to avoid potential traffic issues. Therefore, impacts to transportation under the No Project Alternative could be greater than under the Project.

Tribal Cultural Resources. The potential impacts on tribal cultural resources that would result from excavating new well cellars would be avoided under the No Project Alternative.

Excavation activities associated with the gas system upgrades or other future construction activities on the drill site could result in impacts to tribal cultural resources unless the project triggered a new CEQA analysis to require notification of the Gabrielino/Tongva San Gabriel Band of Mission Indians tribe, as would be required under the proposed Project. SHP would still be required under state law to halt work and contact a qualified archaeologist and the State Historic Preservation Office if unanticipated discoveries of tribal resources occurred. Therefore, impacts would be similar to those described for the Project.

Utilities and Service Systems. All less than significant impacts associated with the proposed Project would remain the same under the No Project Alternative.

4.2 Alternative 1 – 2-Year Permit Term

During the public scoping period, comments suggested that the City consider shorter permit durations for the CUP extension, specifically suggesting 10-years or 2-years. During the entitlement process for the CUP, the City Council and Planning Commission have the authority and discretion to set forth CUP term limits. Both the suggested 10-year and 2-year permit periods are technically feasible and could meet the project objective of continued oil production, although to a lesser degree than the proposed Project. Under Alternative 1, the City would approve the renewal of the CUP for the drill sites for another 2-year period, instead of the 20-year period requested by SHP. This alternative would include all aspects of existing operations at the seven drill sites, but the number of new wells likely to be drilled over the CUP period would be reduced to 10, since the maximum number of wells that would be drilled per year under the CUP would be 5 (see Table 2.4-8). At the end of the 2-year permit term, the City could elect to renew the CUP or revoke the CUP. If the City were to revoke the CUP at the end of the 2-year permit period, SHP would continue to operate all existing wells and would be able to redrill existing wells at the drill sites but would not be able to drill any more wells; therefore, 36 of the proposed 46 new wells would not be drilled. As a result, selection Alternative 2 would avoid emissions of criteria air pollutants and greenhouse gases associated with the drilling and operation of 36 wells. However, as described under the No Project Alternative, without an active CUP, SHP would continue to operate in accordance with all other applicable local (e.g. SCAQMD) and state regulations. There would also be no limit on redrilling if the CUP were to expire or be revoked. Without an active CUP, all operations at the seven drill sites would continue without any City conditions of approval or annual reporting. Given that SHP's CUP permit has been renewed and extended numerous times since 1998, it is as reasonably foreseeable that the City would extend the CUP at the end of the 2-year permit period, as it is that the CUP would be revoked. If the CUP were extended, all impacts would be as described for the Project.

Aesthetics. Alternative 1 would avoid drilling after the 2-year period but as described above, with limits on the number of wells drilled, SHP may conduct more redrilling activities at the end of the CUP period, therefore, the overall amount of potential nighttime operations and lighting

would be the same as described for the Project. However, the potential for impacts from new drilling and well cellars would be less than the Project and the potential for impacts from continued operations would be greater.

Air Quality. Alternative 1 would avoid the less than significant short-term emissions from drilling 36 additional oil wells as well as the long-term emissions from operation of these wells. However, without a CUP, SHP would have no limits on the number of redrilling operations and therefore, this alternative may result in greater emissions from increased redrilling operations. Also, without an active CUP there would be no annual reporting requirements. All other effects would be the same as described for the Project.

Biological Impacts. The potential for short-term impacts to nesting birds, bat, and vegetation that may result during drilling activities after year 2 would be avoided, but, if the CUP is revoked at the end of the 2-year period, the recommended CUP conditions of approval to minimize impacts during long-term operations (including redrilling and other construction proposed on the drill sites in the future) would not be implemented and there would be no annual reporting.

Cultural Resources. The potential for impacts to cultural resources from drilling or well cellar construction after year 2 would be avoided. However, if the CUP is revoked after 2 years the recommended CUP conditions of approval to minimize potential impacts of other ground-disturbing activities would not be required and there would be no annual reporting. Therefore, the potential for impacts to cultural resources from continued operations would be greater.

Energy. Under Alternative 1, no new drilling would occur after year 2, and therefore energy consumption associated with the drilling of new wells after this time would be avoided. All other ongoing operations which consume energy would continue under this alternative and the upgrades to the natural gas-powered turbine/electric generation facility which would improve efficiency would also be completed. There would be no annual reporting of energy related permitting.

Geology and Soils. The potential for impacts to paleontological resources from drilling or well cellar construction after year 2 would be avoided. However, if the CUP is revoked after year 2, the recommended CUP conditions of approval to minimize potential impacts of other ground-disturbing activities would not be required and there would be no annual reporting. Therefore, the potential for impacts to paleontological resources from continued operations would be greater.

Greenhouse Gas Emissions. Short-term emissions of GHG during oil well drilling would be avoided after year 2. Overall GHG emissions from continued operations would be less under the Alternative 1 because 36 fewer wells would be drilled and operating; however, under Alternative #1, increased redrilling activity and associated GHG emissions could result if the CUP were revoked. However, there would be no CUP conditions of approval regarding

documentation of emissions, permitting, or violations, and no annual review to report on the GHG emissions.

Hazards and Hazardous Materials. As part of ongoing operations, hazardous materials are stored and transported at the drill sites. Under Alternative 1, SHP would continue to follow the required spill control and contingency plans as well as HMBPs, as required under state law, and would continue to update and maintain these plans as needed to reduce risks associated with storing hazardous materials. Under Alternative 1, there would be no significant change to the amount of hazardous materials, the rate of their transportation, risk of release, or proximity to schools or airport as compared to the proposed Project. However, there would be no annual reporting. Therefore, impacts would be similar to the Project.

Hydrology and Water Quality. All less than significant impacts on hydrology and water quality associated with the proposed Project would remain the same under Alternative 1. SHP would continue to operate its waterflood program in accordance with its Underground Injection Control permit issued by CalGEM. Current water use for ongoing operations would continue under this alternative. However, this alternative would avoid an increase in potable water use at the drill sites, because only 10 new wells would be drilled. Redrilling operations, which would continue under Alternative 1, do not require additional water. However, there would be no annual reporting of water consumption, quality or permitting.

Noise. Alternative 1 would avoid the potential for increased noise levels associated with drilling new wells after year 2; however, ongoing operations at the drill sites would continue which includes redrilling activities. SHP would continue to comply with applicable provisions of the Signal Hill Municipal Code related to noise, but would not be required to implement the CUP conditions of approval relating to noise at the drill sites and there would be no annual reporting. Therefore, impacts related to noise would be slightly less than as described under the Project.

Transportation. Alternative 1 would avoid potential traffic generated to drill new wells after year 2, but worker trips and truck trips associated with redrilling and other continued operations would occur. In addition, the potential exists that SHP may construct additional facilities other than wells on the drill sites in the future and, if the CUP is revoked after year 2, no CUP conditions of approval would be required to avoid potential traffic issues and there would be no annual reporting. Therefore, impacts to transportation under the No Project Alternative could be greater than under the Project.

Tribal Cultural Resources. The potential impacts on tribal cultural resources that would result from excavating new well cellars would be avoided under Alternative 1 after year 2. Excavation related to other future construction activities on the drill site could result in impacts to tribal cultural resources as no CUP conditions of approval, or CEQA Mitigation Measures would require tribal notification unless the excavations required a new CEQA analysis. SHP would still be required under state law to halt work and contact a qualified archaeologist and the State

Historic Preservation Office if unanticipated discoveries of tribal resources occurred. Therefore, impacts would be similar to those described for the Project.

Utilities and Service Systems. All less than significant impacts associated with the proposed Project would remain the same under Alternative 1.

4.3 Alternative 2 - 10-Year Permit Term.

During the public scoping period, comments suggested that the City consider shorter permit durations for the CUP extension, specifically suggesting 10-years or 2-years. During the entitlement process for the CUP, the City Council and Planning Commission have the authority and discretion to set forth CUP term limits. Both the suggested 10-year and 2-year permit periods are technically feasible and could meet the project objective of continued oil production, although to a lesser degree than the proposed Project. However, under a 10-year CUP term alternative, considering the maximum number of wells that may be drilled in a given year (5), per the limits on well drilling specified in Table 2.4-8, SHP would still drill up to 46 additional wells within the footprint of the drill sites. At the end of the 10-year permit term, the City could elect to renew the CUP or revoke the CUP. Given that SHP's CUP permit has been renewed and extended numerous times since 1998, it is reasonably foreseeable that the City would extend the CUP at the end of the 10-year permit period. However, if the City were to revoke the CUP at the end of the 10-year permit period, SHP would continue to operate the drill sites, including all 46 wells drilled during the 10-year permit term. Further, while the maximum number of wells that SHP may drill in a year is set at five, on average, SHP would plan to drill two wells per year. Therefore, if the permit term is set to ten years it is more likely that SHP would elect to drill the maximum number of wells allowed per year before the end of the permit term. In addition, if the permit is revoked after the 10-year term, while SHP would no longer be able to drill any new wells, they would be able to continue redrilling existing wells. If the CUP is revoked, SHP's existing operations at the seven CUP Sites would continue without an active CUP in accordance with the City's municipal code, including redrilling of existing wells. As such, there would be no limit on the number of redrills that could occur in a single year, no CUP conditions requiring noise mitigation during redrill operations and no CUP Annual Review reporting. Therefore, a 10-year permit term would not reduce or avoid any of the impacts described for the Project, and if revoked at the end of the 10-year period, would likely result in greater impacts from continued operations related to noise and traffic.

Aesthetics. Alternative 2 would not avoid any drilling or redrilling activities, therefore, the amount of potential nighttime operations and lighting would be the same as described for the Project. Therefore, the potential for impacts from both new drilling and continued operations would be the same as described for the project.

Air Quality. Alternative 2 would not avoid any short-term emissions from drilling additional oil wells or the long-term emissions from operation of these wells. All other effects would be the

same as described for the Project. Short-term emissions from redrilling operations may be increased under Alternative 2, as without a CUP in place after year 10, SHP would have the ability to redrill a greater number of wells in a single year. Also, without an active CUP there would be no annual reporting requirements.

Biological Impacts. The potential for short-term impacts to nesting birds, bat, and vegetation that may result during drilling activities after year 10 would be avoided, but, if the CUP is revoked at the end of the 10-year period, the recommended conditions of approval to minimize impacts during long-term operations (including redrilling and other construction proposed on the drill sites in the future) would not be implemented and there would be no annual reporting..

Cultural Resources. The potential for impacts to cultural resources from drilling or well cellar construction would be the same as described for the Project. No new wells or well cellars would be installed after the 10-year period, if the CUP is revoked. Therefore, the potential for impacts to cultural resources from continued operations would be the same as described for the Project.

Energy. Under Alternative 2, the maximum number of new wells that could be drilled under the Project would be drilled within the 10 year period. Therefore, impacts related to energy consumption would be the same as described for the Project. All other ongoing operations which consume energy would continue under this alternative and the upgrades to the natural gas-powered turbine/electric generation facility which would improve efficiency would also be completed. If the CUP is revoked after 10 years, there would be no annual reporting of energy related permitting.

Geology and Soils. Under Alternative 2, the potential for impacts to paleontological resources from drilling or well cellar construction would be the same as described for the Project. However, if the CUP is revoked after year 10, the recommended conditions of approval to minimize potential impacts of other ground-disturbing activities would not be required. Therefore, there would remain the potential for impacts to paleontological resources from continued operations.

Greenhouse Gas Emissions. Under Alternative 2, short-term emissions of GHG during oil well drilling would be the same as described for the Project. Overall GHG emissions from continued operations would potentially be greater than described for the Project, since if the CUP is revoked after year 10, there would be no CUP in place with limits on the number of redrilling operations that could occur in any given year. In addition, there would be no CUP conditions of approval regarding documentation of emissions, permitting, or violations, and no annual review to report on the GHG emissions.

Hazards and Hazardous Materials. As part of ongoing operations, hazardous materials are stored and transported at the drill sites. Under Alternative 2, SHP would continue to follow the required spill control and contingency plans as well as HMBPs, as required under state law, and

would continue to update and maintain these plans as needed to reduce risks associated with storing hazardous materials. Under Alternative 2, there would be no significant change to the amount of hazardous materials, the rate of their transportation, risk of release, or proximity to schools or airport as compared to the proposed Project. However, there would be no annual reporting at the end of the CUP period if the CUP is revoked at the end of the 10 year period. Therefore, impacts would be similar to the Project.

Hydrology and Water Quality. All less than significant impacts on hydrology and water quality associated with the proposed Project would remain the same under Alternative 2. SHP would continue to operate its waterflood program in accordance with its Underground Injection Control permit issued by CalGEM. Current water use for ongoing operations would continue under this alternative. Redrilling operations, which would continue under Alternative 2, do not require additional water. However, there would be no annual reporting of water consumption, quality or permitting.

Noise. Alternative 2 would avoid the potential for increased noise levels associated with drilling new wells after year 10; however, ongoing operations at the drill sites would continue which includes redrilling activities. SHP would continue to comply with applicable provisions of the Signal Hill Municipal Code related to noise, but would not be required to implement the CUP conditions of approval relating to noise at the drill sites and there would be no annual reporting. Therefore, impacts related to noise would be slightly less than as described under the Project.

Transportation. Alternative 2 would avoid potential traffic generated to drill new wells after year 10, but worker trips and truck trips associated with redrilling and other continued operations would occur. In addition, the potential exists that SHP may construct additional facilities other than wells on the drill sites in the future and, if the CUP is revoked after year 10, no conditions of approval would be required to avoid potential traffic issues and there would be no annual reporting. Therefore, impacts to transportation under Alternative 2 could be greater than under the Project.

Tribal Cultural Resources. The potential impacts on tribal cultural resources that would result from excavating new well cellars would be avoided under Alternative 2 after year 10. Excavation related to other future construction activities on the drill site could result in impacts to tribal cultural resources as no CUP conditions of approval, or CEQA Mitigation Measures would require tribal notification unless the excavations required a new CEQA analysis. SHP would still be required under state law to halt work and contact a qualified archaeologist and the State Historic Preservation Office if unanticipated discoveries of tribal resources occurred. Therefore, impacts would be similar to those described for the Project.

Utilities and Service Systems. All less than significant impacts associated with the proposed Project would remain the same under Alternative 2.

4.4 Alternatives Considered but Rejected from Further Analysis

4.4.1 Operate Existing Facilities Only

An alternative was suggested during the public scoping period that the City consider an alternative that would allow continued operations of the drill sites but no new wells. The City considered each of these suggestions and determined that an alternative that did not allow new well drilling is the equivalent of the No Project Alternative. This is because, under City of Signal Hill Municipal Code Sections 1212.050, 1616.010, and 1616.020, if the City revokes the CUP, existing operations at the seven drill sites could continue but SHP would no longer be able to drill any new wells. Further, redrilling of existing wells could also continue under the City of Signal Hill Oil and Gas Code. Therefore, a separate alternative that considers approval of the CUP without new wells is not technically feasible under the Oil and Gas Code and has not been carried forward.

4.5 Environmentally Superior Alternative

Table 4.5-1 summarizes the potential for the alternatives evaluated by this EIR to avoid or result in reduced or similar environmental impacts when compared to the impacts of the Project.

If the No Project Alternative were to be implemented no new oil wells would be drilled at the drill sites and all other existing operations would continue. However, without a CUP, impacts from continued operations would likely be greater than under the Project as the City would have no direct oversight on the CUP operations, beyond the City oil and gas code and there would be no annual reporting mechanism. While SHP would be required to continue operating in accordance with all state and federal regulations and associated permits, the potential exists for greater issues related to community compatibility, such as increased noise and traffic associated with continued operations. The No Project Alternative would avoid the short-term oil well development impacts of the Project and would reduce long-term project-related impacts associated with emissions of criteria air pollutants and greenhouse gases associated with these additional wells. The No Project Alternative would achieve the objective of the Project to continue oil production at the drill sites, although total production would decrease year over year as production declines in the existing wells.

The 2-Year Permit Term Alternative would reduce emissions of criteria air pollutants and greenhouse gas related to drilling and operation of new wells, as the maximum number of new wells that would be drilled is 10 compared to 46. The 10-Year Permit Term Alternative would not reduce any emissions of criteria air pollutants or greenhouse gases related to drilling and operation of new wells, as SHP would be able to drill the maximum number of wells proposed under the Project within the 10 year period. Similar to the No Project Alternative, if the CUP is revoked at the end of the 2-year period (Alternative 1) or 10-year period (Alternative 2), impacts from continued operations would likely be greater than under the Project as the City

would have no direct oversight on the CUP operations and no annual reporting mechanism. In addition, while no new wells could be drilled if the CUP is revoked at the end of either the 2-year period (Alternative 1) or 10-year period (Alternative 2), there would be no limits on the number of redrill operations that could be conducted in a single year, and it is reasonably foreseeable that SHP would conduct a greater number of redrill operations in order to maintain production levels. While SHP would be required to continue operating in accordance with all state and federal regulations and associated permits, the potential exists for greater community compatibility issues, such as increased noise and traffic associated with continued operations. If the CUP is renewed, SHP would have the ability to continue drilling new wells. Therefore, in the event the CUP is renewed, impacts under both the 2-Year Permit Term Alternative and 10-Year Permit Term Alternative would be similar to the Project. Given that if the CUP is revoked at the end of either the 2-Year Permit Term Alternative or 10-Year Permit Term Alternative, impacts related to community compatibility would be greater as a result of continued drill site operations without City oversight, neither alternative is considered the Environmentally Superior Alternative. Because the Project would maintain City oversight of all drill site operations and impose a cap on the number of new drills and redrills that could occur in any given year, for the entire 20-year permit term, the Project is considered the Environmentally Superior Alternative.

Table 4.5-1: Summary of Project and Alternative Environmental Impacts and Mitigation Measures

Would the Project?	Project	No Project Alternative	Alternative 1 – 2 Year Permit Term	Alternative 2 – 10 Year Permit Term
Aesthetics				
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	Less than Significant with Mitigation	Reduced	Reduced	Similar
Air Quality				
a) Conflict with or obstruct implementation of the applicable air quality plan?	Less than Significant	Similar	Similar	Similar
b) 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?	Less than Significant	Reduced	Reduced	Greater
c) Expose sensitive receptors to substantial pollutant concentrations?	Less than Significant	Reduced	Similar	Greater
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	Less than Significant	Reduced	Reduced	Similar
Biological Resources				
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 Wildlife or U.S. Fish and Wildlife Service?	Less than Significant with Mitigation	Reduced	Reduced	Similar
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?	Less than Significant with Mitigation	Reduced	Reduced	Similar
Cultural Resources				

Would the Project?	Project	No Project Alternative	Alternative 1 – 2 Year Permit Term	Alternative 2 – 10 Year Permit Term
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	Less than Significant	Avoided	Greater	Greater
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	Less than Significant with Mitigation	Avoided	Greater	Greater
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	Less than Significant	Greater	Greater	Similar
Energy				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	Less than Significant	Reduced	Reduced	Similar
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	Less than Significant	Avoided	Reduced	Similar
Geology and Soils				
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Less than Significant with Mitigation	Greater	Greater	Similar
Greenhouse Gas Emissions				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Less than Significant	Reduced	Reduced	Greater
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Less than Significant	Avoided	Similar	Similar
Hazards and Hazardous Materials				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Less than Significant	Similar	Similar	Similar

Would the Project?	Project	No Project Alternative	Alternative 1 – 2 Year Permit Term	Alternative 2 – 10 Year Permit Term
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?	Less than Significant	Similar	Similar	Similar
c) 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	Similar	Similar	Similar
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	Less than Significant	Similar	Similar	Similar
Hydrology and Water Quality				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	Less than Significant	Similar	Similar	Similar
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	Less than Significant	Similar	Similar	Similar
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: <ul style="list-style-type: none"> i. result in a substantial erosion or siltation on- or off-site; ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; iii. 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; 	Less than Significant	Avoided	Reduced	Similar
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	Less than Significant	Similar	Similar	Similar
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	Less than Significant	Similar	Similar	Similar
Noise				

Would the Project?	Project	No Project Alternative	Alternative 1 – 2 Year Permit Term	Alternative 2 – 10 Year Permit Term
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less than Significant with Mitigation	Reduced	Reduced	Similar
b) Generation of excessive groundborne vibration or groundborne noise levels?	Less than Significant	Reduced	Reduced	Similar
c) For a project located within the vicinity of a private airstrip or 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?	Less than Significant	Similar	Similar	Similar
Transportation				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	Less than Significant with Mitigation	Greater	Greater	Greater
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	Less than Significant	Similar	Similar	Similar
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	Less than Significant	Similar	Similar	Similar
d) Result in inadequate emergency access?	Less than Significant	Similar	Similar	Similar
Tribal Cultural Resources				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources	Less than Significant with Mitigation	Similar	Similar	Similar

Would the Project?	Project	No Project Alternative	Alternative 1 – 2 Year Permit Term	Alternative 2 – 10 Year Permit Term
Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.				
Utilities and Service Systems				
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	Less than Significant	Reduced	Reduced	Similar
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	Less than Significant	Similar	Similar	Similar

SECTION 5 References

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SECTION 6 List of Preparers

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	Cultural Resources
	Tribal Cultural Resources
	Hazards and Hazardous Materials
	Hydrology and Water Quality
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	Energy
	Greenhouse Gas Emissions
	Noise
	Transportation
David Blankenhorn, PG	Hydrology and Water Quality
	Geology and Soils
Charlie Piechowski, MESM	GIS
Dan Tormey PhD, PG	Quality Control, Technical and Policy Review
City of Signal Hill	
Colleen T. Doan	Community Development Director
Carlos Luis	Planning Manager